



Industrial Braking Systems

SIME™ BRAKES





DECADES OF EXPERIENCE

Across Industries and Applications



Founded in 1932, Stromag™ has grown to become a globally recognized leader in the development and manufacture of innovative power transmission components for industrial drivetrain applications.

Stromag engineers utilize the latest design technologies and materials to provide creative, energy-efficient solutions that meet their customer's most challenging requirements.

Stromag's extensive product range includes flexible couplings, disc brakes, limit switches, an array of hydraulically, pneumatically, and electrically actuated brakes, and a complete line of electric, hydraulic and pneumatic clutches.

Stromag engineered solutions improve drivetrain performance in a variety of key markets including energy, off-highway, metals, marine, transportation, printing, textiles, and material handling on applications such as wind turbines, conveyor systems, rolling mills, agriculture and construction machinery, municipal vehicles, forklifts, cranes, presses, deck winches, diesel engines, gensets and stage machinery.

VISIT US ON THE WEB AT **STROMAG.COM**



SIME™ Brakes

SECURITY - QUALITY - RELIABILITY

With more than 60 years of experience, Stromag™ provide high efficiency braking systems to equip steel industries, nuclear plants, port cranes, offshore winches and mass transports throughout the world.

Quality and innovation have always been the two essential features in the development of the company. Therefore Stromag provide disc brakes certified by recognized authorities such as DNV, ABS, TUV, Lloyd's Register and EDF.

In 2018, ISO 9001 certification of our Quality management system was renewed under the version V2015 and our Safety management system was awarded OHSAS 18001 - V2007 certification.

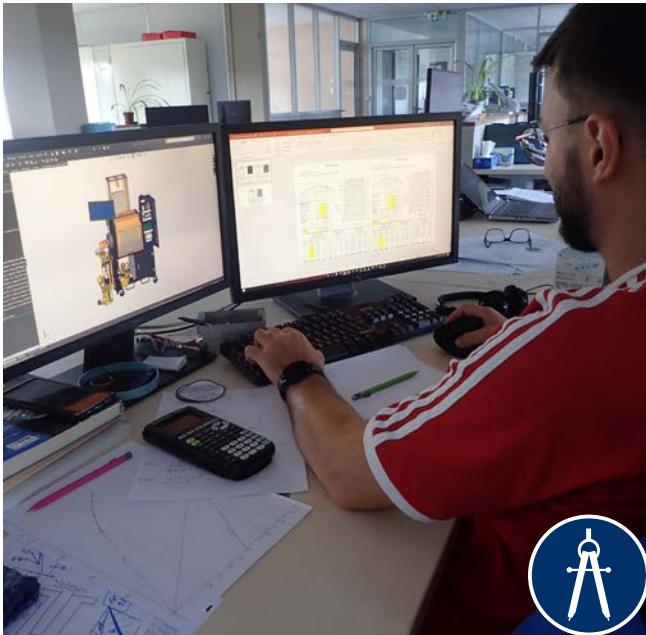
Whatever the application, Stromag meet the global supply requirements with standard or fully customised braking systems solutions.



CONTENT

OUR KNOW-HOW AT YOUR DISPOSAL	6
SIME™ BRAKES PRODUCTS	8
SOLUTIONS FOR YOUR APPLICATION	10
SERVICE BRAKES	12
ELECTROMAGNETIC SERVICE BRAKES	14
ELECTRICAL POWER UNITS	24
THRUSTER SERVICE BRAKES	30
DRUM BRAKES	42
HYDRAULIC SERVICE BRAKES	56
EMERGENCY BRAKES	60
ELECTROMAGNETIC EMERGENCY BRAKES	62
ELECTRICAL POWER UNITS	68
HYDRAULIC EMERGENCY BRAKES TYPE SH	76
HYDRAULIC EMERGENCY BRAKES TYPES SHD / TH	104
HYDRAULIC POWER UNITS	118
LOWERING UNIT	130
SAFETY SYSTEMS	134
SPEED MONITORING	136
BRAKING SYSTEMS CONTROL AND MONITORING	146
DISCS & COUPLINGS	160
CARDAN SHAFTS	188
HYDRAULIC BUFFERS	194

OUR KNOW-HOW AT YOUR DISPOSAL



RESEARCH & DEVELOPMENT DEPARTMENT

In a mutually beneficial way, Stromag™ create a strong relationship with their customers in order to understand their needs and provide them the best solution. With in-depth knowledge and experience in all key applications and markets, our teams keep constantly abreast of every changing needs and market development.



TRAINING

The Stromag France training center, Qualiopi certified, proposes to its customers training sessions: upgrade operations on-site or trainings in the production center in La Guerche (France). Each training consists of two parts: theoretical in a classroom and practical in the work-shop.

Topics: products operation, periodic maintenance, settings, fault diagnosis.

BENEFITS

- A team of experts at your disposal
- Reactivity of the interventions
- Study of the specific requirements
- Secured installation
- Optimal operation of the braking systems
- Preventive maintenance
- Expertise sustainability

Qualiopi
processus certifié

 **RÉPUBLIQUE FRANÇAISE**

The quality certification was issued
under the following action category:
TRAINING ACTIONS

Reactivity, availability and listening to the customer are values which define our teams. We put all our experience and knowledge at your disposal:



DIAGNOSIS

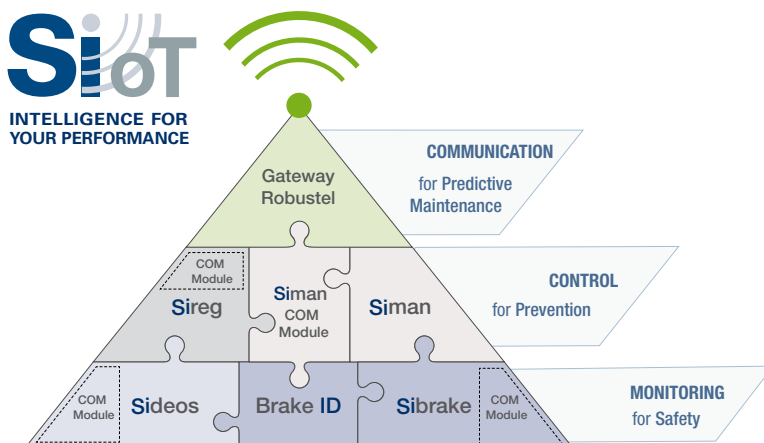
The After Sales team shares its “know-how” with companies having an important fleet to help them to realise a self-diagnosis on their brakes systems to achieve their maximal reliability in compliance with the safety regulations. The diagnosis takes place in two stages: a complete on-site examination of the different devices and a detailed report with synthesis for a global visibility.



INTERVENTION

Stromag™ has many sub-structures in France and worldwide, these allow our After Sales Service Department to intervene very quickly at the customer sites.

Each member of our team has a qualified engineering background which means they are well qualified to help and advise customers technically and commercially.



SiIoT concept includes several modules, each having specific functions:

Speed Monitoring

- HPP Control and Monitoring
- Regulated Braking - Brake monitoring
- Lifting Monitoring - Information Exchange
- Data process & communication

These modules can exchange various information with each other. They can be selected alone or combined accordingly to the installation requirements.

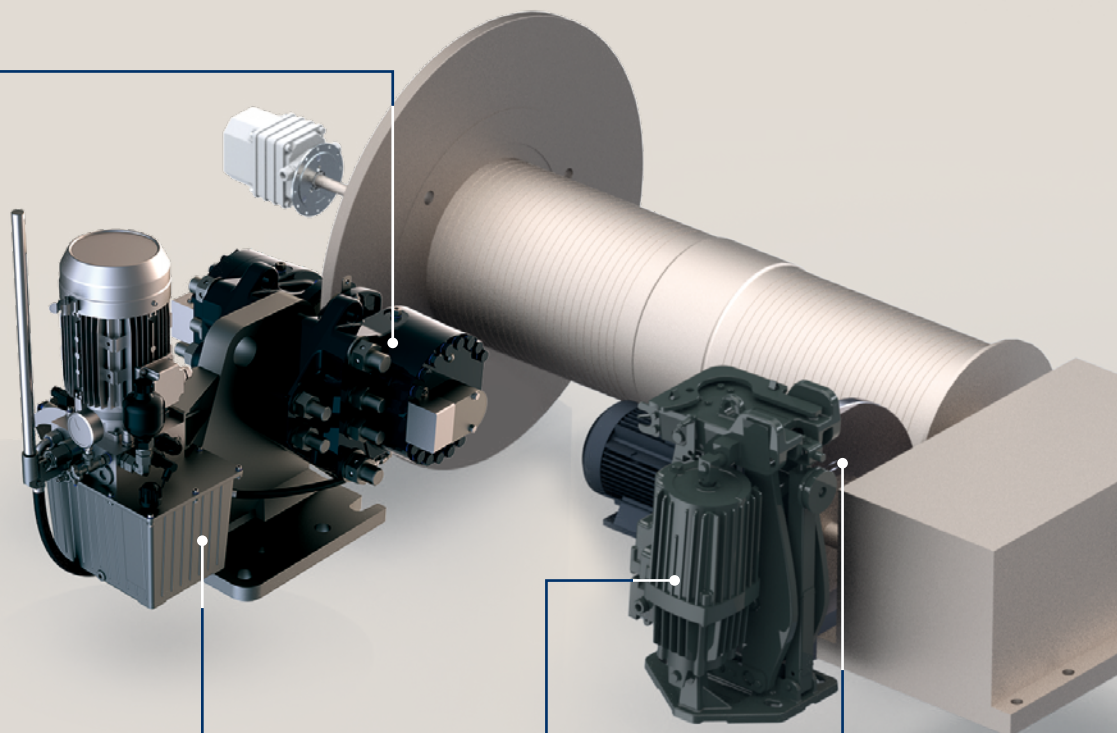
SIME™ Brakes PRODUCTS



Hydraulic
emergency brakes



Hydraulic
Power Packs



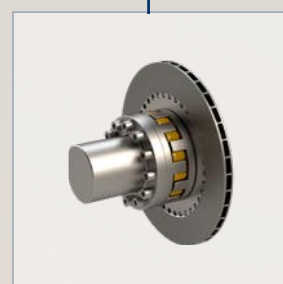
Drums &
couplings



Drum brakes
with thruster



Disc brakes
with thruster



Discs &
couplings

COMPLETE BRAKING SOLUTIONS



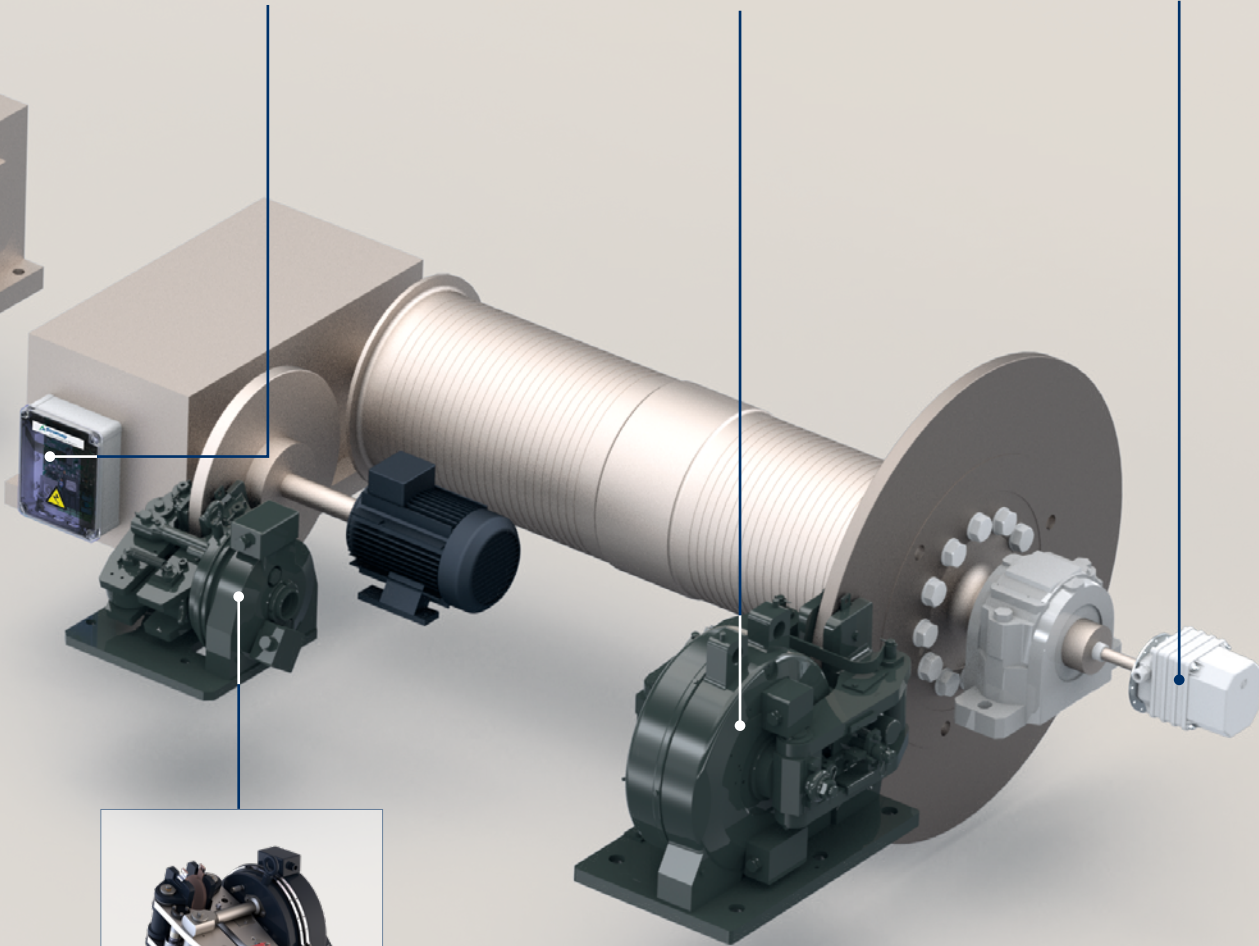
Electrical
power units



Electromagnetic
emergency brakes



Safety systems

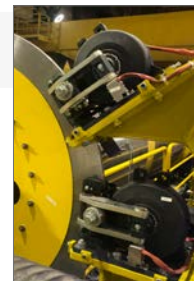


Electromagnetic
service brakes

SOLUTIONS FOR YOUR APPLICATION

STEEL INDUSTRIES

- Ladle cranes
- Charging cranes
- Scrap cranes



CONSTRUCTION INDUSTRIES

- Flat top tower cranes
- Luffing jib tower cranes
- MOPS:
Manual Overload Protection System



Photo courtesy of MORITSCH



HEAVY LIFT OFFSHORE CRANES

- Pipeline laying systems:
Pipeline tensioners and pull-storage winches
- Cranes on construction vessels
for the installation of offshore wind turbines



NUCLEAR INDUSTRIES

- Overhead cranes:
Engine room - pumping stations
Fuel and auxiliary buildings
- Polar cranes: reactor buildings
- Fuel descenders

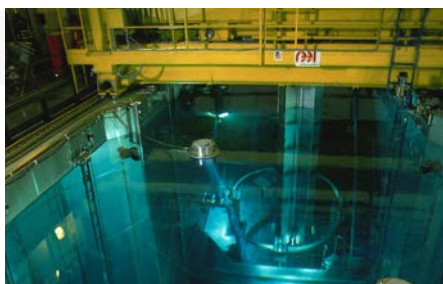


Photo courtesy of EDF



OTHER HOISTING APPLICATIONS

- Cableways - Ski lifts
- Amusement parks
- Theaters - Eiffel Tower
- Subways
- Ships lifts



CERTIFICATIONS

SIME™ Brakes products and services comply with the requirements of our customers in terms of quality, safety, service life, easy maintenance and delivery times. The quality and environmental policy is an integral part of our company policy.

The certification ISO9001 of our Quality management system is renewed under the version ISO 9001 - V2015 in 2018, combined with ISO45001 V2018 certification.

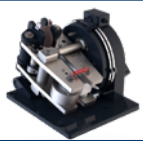
Stromag France received also the ISO 19443 : 2018 certification for the provision of products important to nuclear safety (2023) and the Qualiopi certification for training actions (2022).

With more than 60 years of experience in the supply of high efficiency braking systems, Stromag™ provides disc brakes certified by recognized organizations such as DNV, ABS, TUV, Lloyd's Register and EDF.



SERVICE BRAKES



ELECTROMAGNETIC BRAKES		Braking torque (kN.m)													
		0	2	4	6	8	10	12	14	16	18	20	22	24	26
645-650-660 5D / 45D discs Ø175 to 625															
1CA2-2CA2 3CA2-4CA2 discs Ø445 to 995															

THRUSTER BRAKES		Braking torque (kN.m)													
		0	2	4	6	8	10	12	14	16	18	20	22	24	26
TDXB I and II FAV 10 to 50 discs Ø220 to 995															

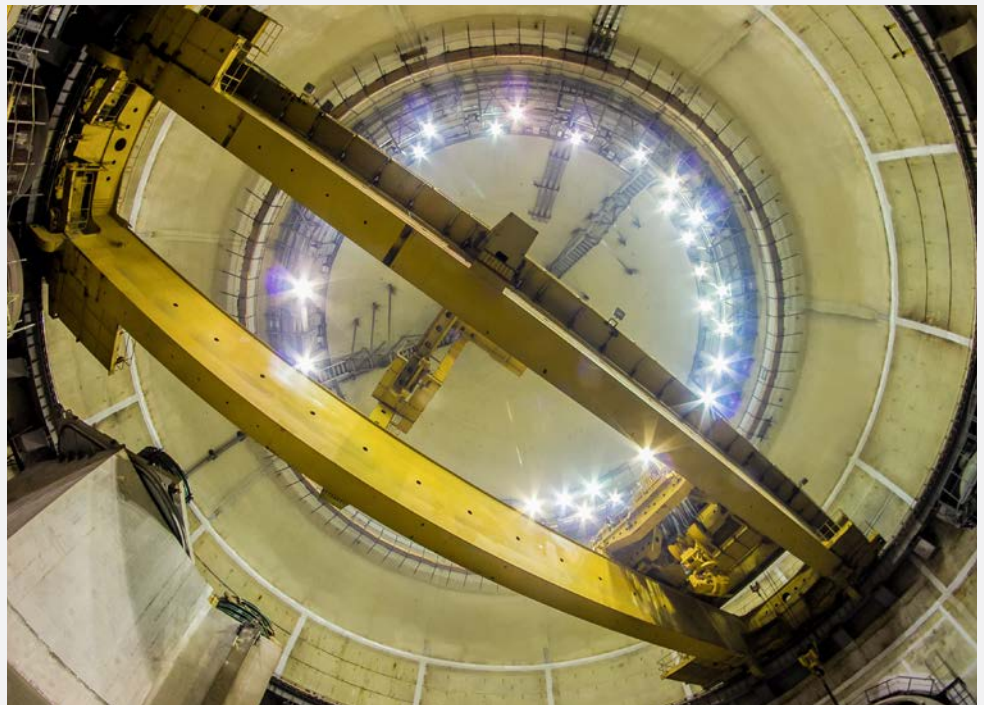
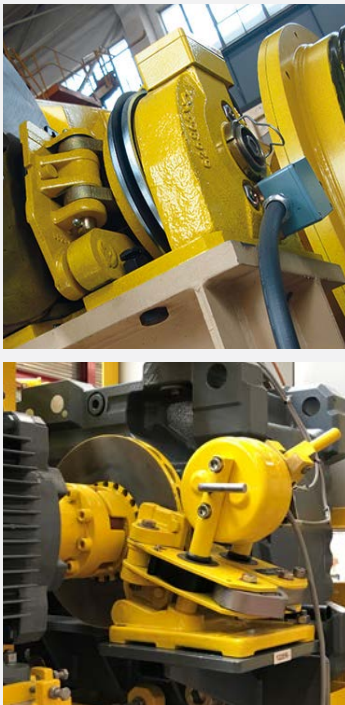
DRUM BRAKES		Braking torque (kN.m)													
		0	2	4	6	8	10	12	14	16	18	20	22	24	26
SDB-SAB FNS-FED drums Ø150 to 760															
FEM drums Ø200 to 750															

HYDRAULIC BRAKES		Braking torque (kN.m)													
		0	2	4	6	8	10	12	14	16	18	20	22	24	26
2TB-3TB-4TB discs Ø445 to 995															
1TSA-1TXA discs Ø625 to 995															

ELECTROMAGNETIC SERVICE BRAKES

APPLICATIONS

- STEEL CRANES
- PORT CRANES
- NUCLEAR CRANES
- MASS TRANSPORTS



MAIN CHARACTERISTICS	OPTIONS
- FAILSAFE BRAKE BY SPRING APPLICATION - ELECTROMAGNETIC RELEASE - OPENING PROVING SWITCH	- MECHANICAL RELEASE LEVER - HYDRAULIC RELEASE - CLOSING PROVING SWITCH - MANUAL RELEASE CONTROL SWITCH - HIGH TEMPERATURE, IRON AND STEEL CONDITIONS



645-650-660

- Association with discs Ø175 to 625
- Manual wear compensation
- Option:
Mounting on a vertical axis disc



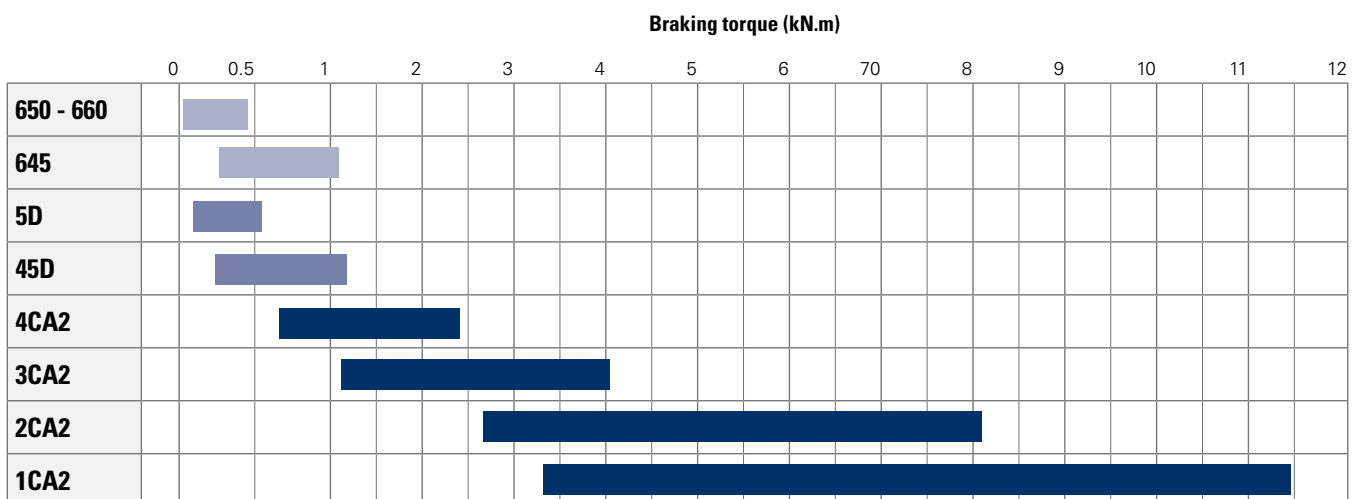
5D - 45D

- Association with discs Ø315 to 625
- Automatic wear compensation
- Option:
Mounting on a vertical axis disc



**4CA2 - 3CA2
2CA2 - 1CA2**

- Association with discs Ø445 to 995
- Automatic wear compensation
- Left and right hand calipers
- Option: Manual wear compensation



Service Brakes

DISC BRAKE - 650 AND 660 CALIPERS

Revision number: T03150-01-G

Revision date: 10.04.2018

Fail safe braking
Spring application
Electromagnetic release
Manual lining wear compensation
Brake pads with wear indicator
Opening proving switch for PLC
With coil supply wire: 2 x 2mm², length 2m

Conditions of use:

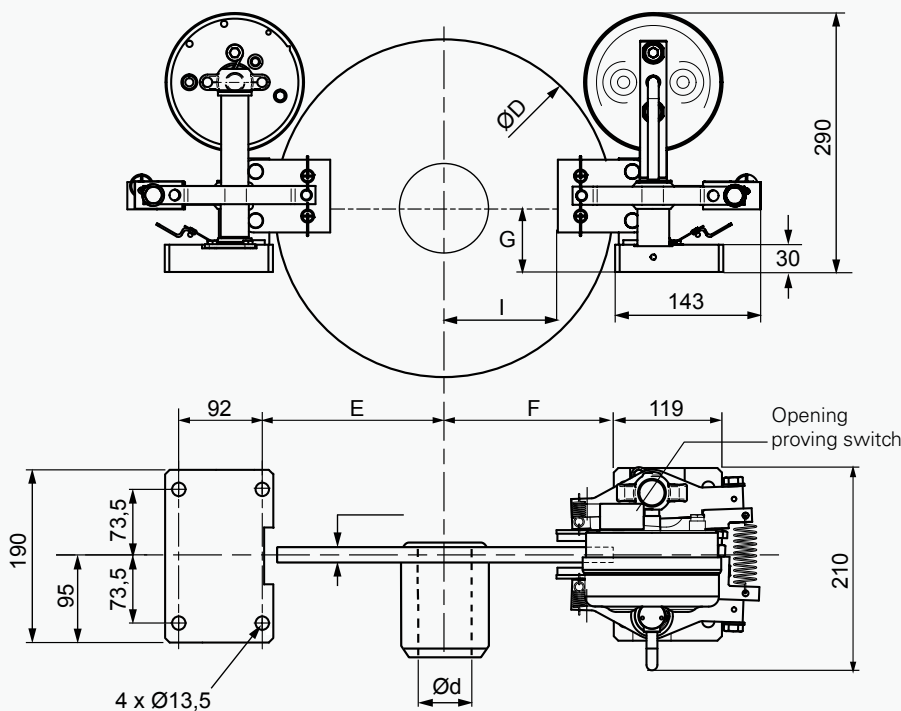
- Ambient temperature -10°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65μ
- Other conditions, consult us.

Use:

- Service brake for application ≤ 150 stops/h

Options:

- Lowering system with lever
- Hydraulic lowering system
- Mounting on vertical axis disc
- Marine protection
- Closing proving switch
- Manual release switch



Opening proving switch:

250VAC maxi., 5A maxi., with interrupting capacity: 50VA maxi.
220VDC maxi., 5A maxi., with interrupting capacity: 50W maxi.

Compatible with PLC (Programmable Logic Controllers). An opening switch used with other equipment than PLC must not be reused with a PLC.

The opening switch is delivered with 3 x 0.75mm² cable, length 2m

Weight: 19 kg
Dimensions in mm

Response time at nominal torque: see the leaflet of the associated electrical power supply.

Discs			Thickness 15 mm									Thickness 30 mm						
Maximum speed of the disc for nominal torque		tr/mn	5000	4300	3600	3000	2400	2100	1900	1800	1500	3000	2700	2400	2100	1900	1800	1500
D		mm	175	220	260	315	395	445	495	550	625	315	355	395	445	495	550	625
d		mm	0-40	0-55	0-75	0-75	0-75	0-75	0-100	0-100	0-100	0-50	0-60	0-70	0-70	0-100	0-100	0-100
E		mm	118	128	143	173	213	238	263	293	328	173	193	213	238	263	293	328
F		mm	106	116	131	161	201	226	251	281	316	161	181	201	226	251	281	316
G		mm	85	85	85	75	60	50	45	45	25	75	60	60	50	45	45	25
I (approx. dimension)		mm	43	53	68	98	138	163	188	218	253	98	118	138	163	188	218	253
Caliper 650:																		
Nominal torque for 1 caliper adjustable from 100% to 50%		N.m	110	130	150	190	260	300	350	390	460	190	220	260	300	350	390	460
Max. reaction on shaft	1 caliper	N	1600									1600						
	2 calipers	N	0			260	570	580	560	510	680	260	550	570	580	560	510	680
Caliper 660:																		
Nominal torque for 1 caliper adjustable from 100% to 60%		N.m	55	65	75	95	130	150	175	195	230	95	110	130	150	175	195	230
Max. reaction on shaft	1 caliper	N	800									800						
	2 calipers	N	0			130	285	290	280	255	340	130	275	285	290	280	255	340

DISC BRAKE - 645 CALIPER

Revision number: T03250-01-F

Revision date: 22.06.2023

Fail safe braking
Spring application
Electromagnetic release
Manual wear compensation
Brake pads with wear indicator
Opening proving switch for PLC
With coil supply wire: 2 x 2mm², length 2m

Conditions of use:

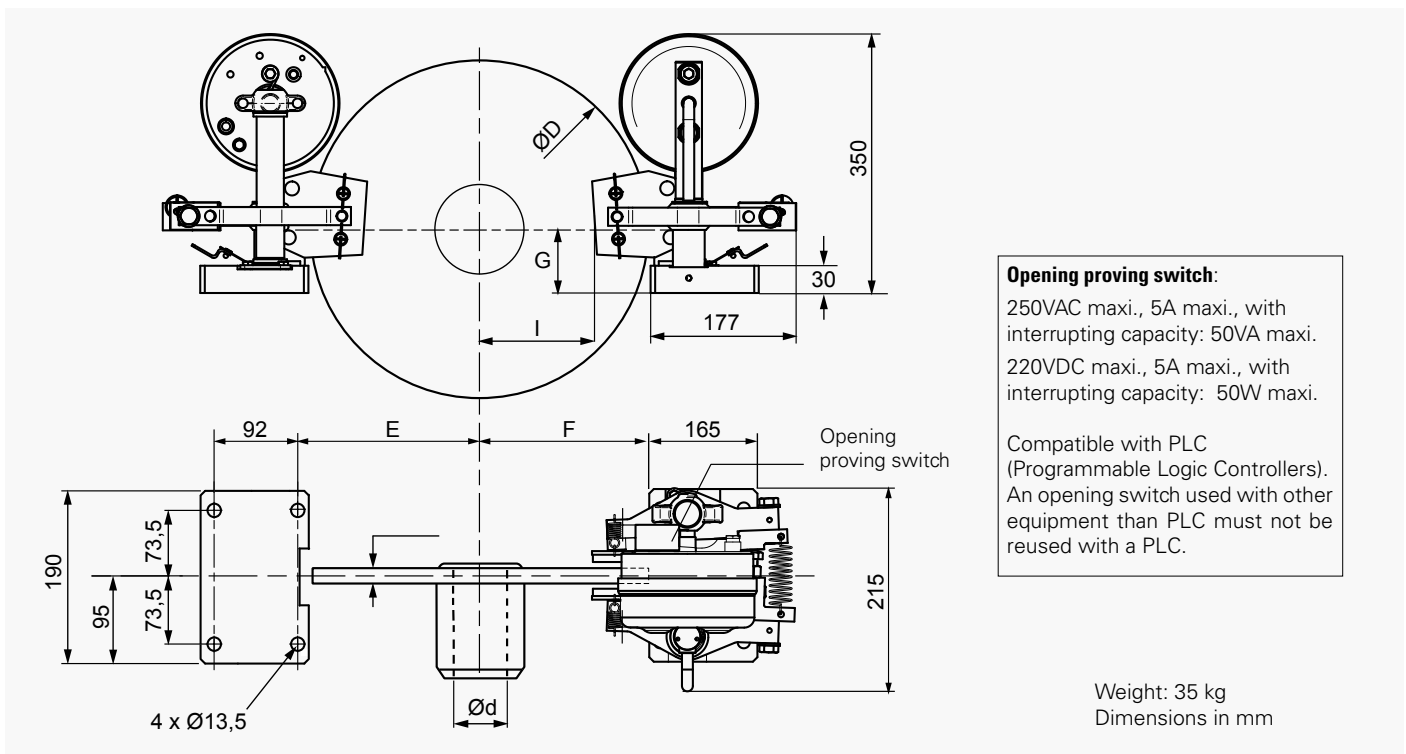
- Ambient temperature -10°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ
- Other conditions, consult us.

Use:

- Service brake for application ≤ 150 stops/h

Options:

- Lowering system with lever
- Hydraulic lowering system
- Mounting on vertical axis disc
- Marine protection
- Closing proving switch
- Manual release switch



Response time at nominal torque: see the leaflet of the associated electrical power supply.

Designation		Discs	solid and thickness 15 mm						self-ventilated and thickness 30 mm						
Nominal torque for 1 caliper adjustable from -30% to +20%		N.m	380	520	600	700	780	920	380	440	520	600	700	780	920
Maximum speed of the disc for nominal torque		rpm	3000	2400	2100	1900	1800	1500	3000	2700	2400	2100	1900	1800	1500
D	mm		315	395	445	495	550	625	315	355	395	445	495	550	625
d	mm		0-75	0-75	0-75	0-100	0-100	0-100	0-50	0-60	0-70	0-70	0-100	0-100	0-100
E	mm		173	213	238	263	293	328	173	193	213	238	263	293	328
F	mm		161	201	226	251	281	316	161	181	201	226	251	281	316
G	mm		95	80	70	65	65	45	95	80	80	70	65	65	45
I (approx. dimension)	mm		76	116	141	166	196	231	76	96	116	141	166	196	231
Max. reaction on shaft	1 caliper	N	3850						3850						
	2 calipers	N	405	405	810	895	780	1230	405	515	450	810	895	780	1230

Service Brakes

DISC BRAKE - 5D AND 5DR CALIPERS

Revision number: T03360-01-F

Revision date: 28.03.2024

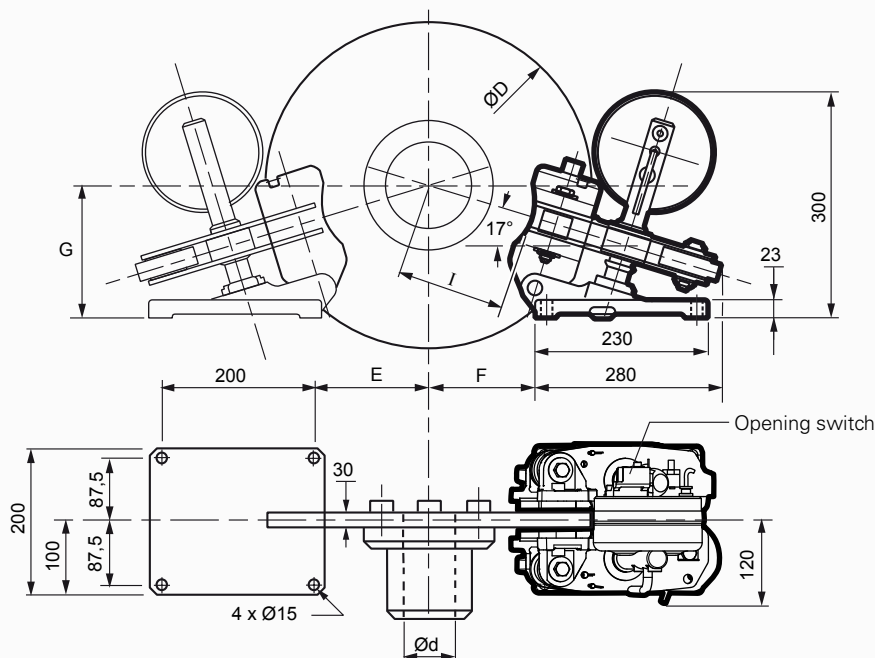
Fail safe braking
Spring application
Electromagnetic release
Automatic wear compensation
Brake pads with wear indicator
Opening proving switch
With coil supply wire: $2 \times 2 \text{ mm}^2$, length 2 m
Association with discs thickness 30mm
(or 15 mm in option)
Shoes DIN

Conditions of use:

- Ambient temperature - 10°C to $+60^\circ\text{C}$
 - Relative humidity $\leq 70\%$
 - Dust in atmosphere $\geq 65 \mu$
- Other conditions, consult us.

Options:

- Manual lining wear compensation
- Lowering system hydraulic or with lever
- Bearing bracket for mounting in place of a 650 or 660 caliper
- Mounting on a vertical axis disc
- Closing proving switch
- Manual release switch
- **5DR**: Reduced torque
- **5DE**: Electrical progressive braking
- Marine protection



Opening proving switch:

250VAC maxi., 5A maxi., with interrupting capacity: 50VA maxi.
220VDC maxi., 5A maxi., with interrupting capacity: 50W maxi.

Compatible with PLC (Programmable Logic Controllers).
An opening switch used with other equipment than PLC must not be reused with a PLC.

The opening switch is delivered with $3 \times 0.75 \text{ mm}^2$ cable, length 2m

Weight: 27 kg
Dimensions in mm

Response time at nominal torque: see the leaflet of the associated electrical power supply.

Discs		220	260	315	355	395	445	495	550	625	
Maximum speed of the disc for nominal torque		rpm	4300	3600	3000	2700	2400	2100	1900	1800	1500
D	mm	220	260	315	355	395	445	495	550	625	
E	mm	65	80	100	120	140	160	190	220	255	
F	mm	50	65	85	105	125	145	175	205	240	
G	mm	150	153	160	164	170	180	185	195	205	
I (approx. dimension)	mm	51	68	88	108	128	151	176	213	248	
Caliper 5D:											
Nominal torque for 1 caliper adjustable from - 50% to +20%		N.m.	130	150	190	220	260	300	350	390	460
Maximum reaction on shaft		1 caliper N 2 calipers N	1950 1150								
Caliper 5DR:											
Nominal torque for 1 caliper adjustable from 100% to -50%		N.m.	65	75	95	110	130	150	175	195	230
Maximum reaction on shaft		1 caliper N 2 calipers N	815 480								

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

DISC BRAKE - 4CA2 CALIPER

Revision number: T10049-01-F

Revision date: 26.06.2023

Fail safe braking
Braking by spring application
Electromagnetic release
Automatic wear compensation
Opening proving switch
Brake pads with wear indicator

Working conditions:

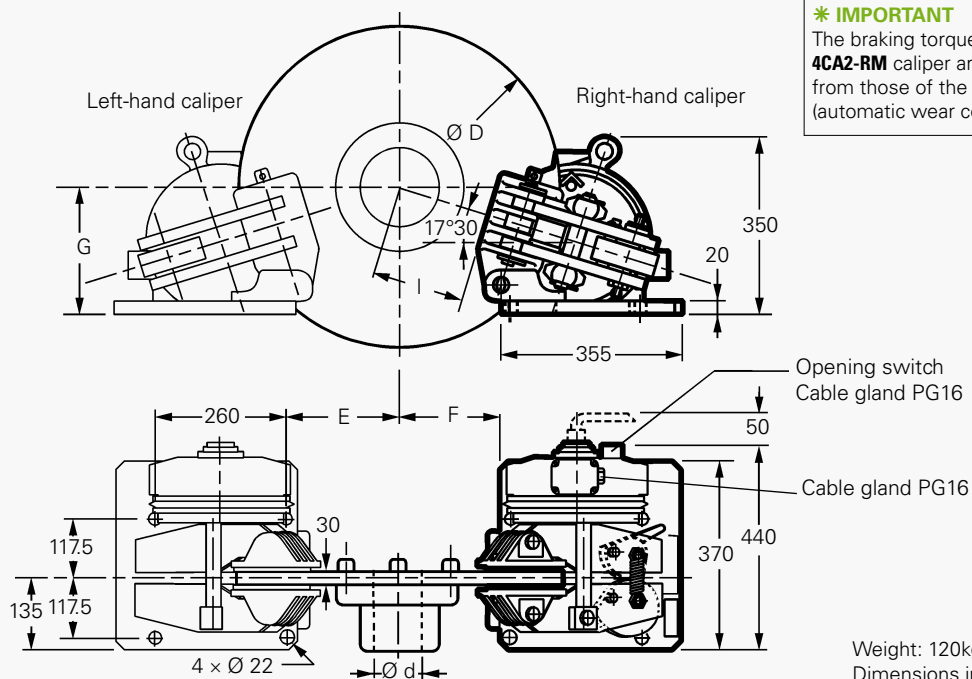
- Ambient temperature: -10°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ
- Other conditions, consult us.

Use:

Any application up to 1000act/h

Options:

- Manual wear compensation *
- Manual release lever
- Hydraulic release
- Flameproof protection
- Marine protection
- Closing proving switch
- Switch on release nut



* IMPORTANT

The braking torques of the **4CA2-RM** caliper are different from those of the **4CA2** caliper (automatic wear compensation).

Weight: 120kg
Dimensions in mm

Response time at nominal torque: see the leaflet of the associated electrical power supply.

Discs		445	495	550	625	705	795
Nominal torque for 1 caliper adjustable from -30 to +20%	N.m	950	1100	1270	1500	1750	2000
Maximum disc speed for nominal torque	r.p.m.	2100	1900	1800	1500	1300	1200
D	mm	445	495	550	625	705	795
d	mm	0-70	0-100	0-100	0-100	0-120	0-130
E	mm	130	160	180	215	255	295
F	mm	110	140	160	195	235	275
G	mm	225	235	240	250	260	275
I (approx. dimension)	mm	90	125	145	180	225	265
Maximum reaction on shaft	1 caliper	N					
	2 calipers	N					

Opening proving switch:

250VAC maxi., 5A maxi., with interrupting capacity: 50VA maxi.

220VDC maxi., 5A maxi., with interrupting capacity: 50W maxi.

Compatible with PLC (Programmable Logic Controllers).
An opening switch used with other equipment than PLC must not be reused with a PLC.

NOTE :

If the load stopping distance is too long, associate the caliper with an **AC64-50 FB** power supply. See the relevant leaflet.

Service Brakes

DISC BRAKE - 3CA2 CALIPER

Revision number: T10050-01-D

Revision date: 09.04.2019

Fail safe braking
Braking by spring application
Electromagnetic release
Automatic wear compensation
Opening proving switch
Brake pads with wear indicator

Working conditions:

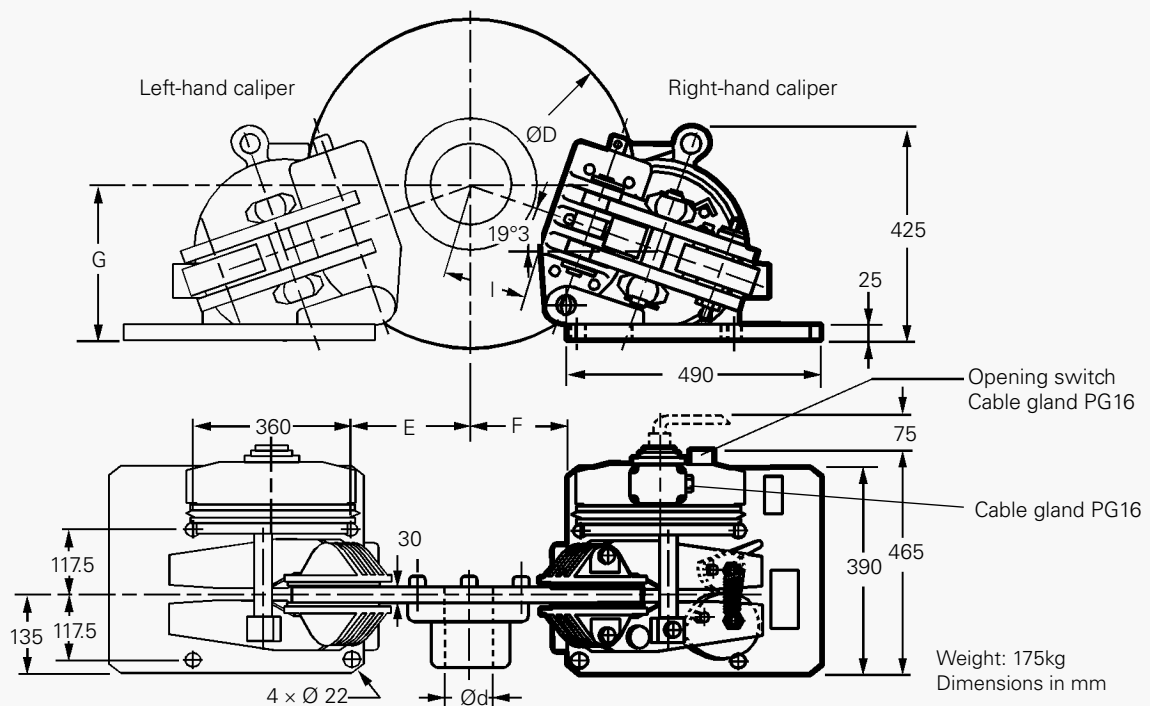
- Ambient temperature: -10°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65μ
- Other conditions, consult us.

Use:

Any application up to 1000act/h

Options:

- Manual release lever
- Hydraulic release
- Manual wear compensation
- Load regulated lowering
- Steelworks flameproof protection
- Marine protection / • Special paint
- Closing proving switch
- Switch on release nut



Response time at nominal torque: see the leaflet of the associated electrical power supply.

Discs		445	495	550	625	705	795
Nominal torque for 1 caliper adjustable from -30 to +20%	N.m	1600	1850	2100	2500	2900	3350
Maximum disc speed for nominal torque	r.p.m.	2100	1900	1800	1500	1300	1200
D	mm	445	495	550	625	705	795
d	mm	0-70	0-100	0-100	0-100	0-120	0-130
E	mm	100	120	150	185	225	265
F	mm	80	100	130	165	205	245
G	mm	285	295	305	315	330	345
I (approx. dimension)	mm	90	115	145	180	225	265
Maximum reaction on shaft	1 caliper	N					
	2 calipers	N					

Opening proving switch:

250VAC maxi., 5A maxi., with interrupting capacity: 50VA maxi.
220VDC maxi., 5A maxi., with interrupting capacity: 50W maxi.

Compatible with PLC (Programmable Logic Controllers).
An opening switch used with other equipment than PLC must not be reused with a PLC.

DISC BRAKE - 2CA2 AND 1CA2 CALIPERS

Revision number: T10051-01-D / T10065-02-B

Revision date: 09.04.2019

Fail safe braking
Braking by spring application
Electromagnetic release
Automatic wear compensation
Opening proving switch
Brake pads with wear indicator

Working conditions:

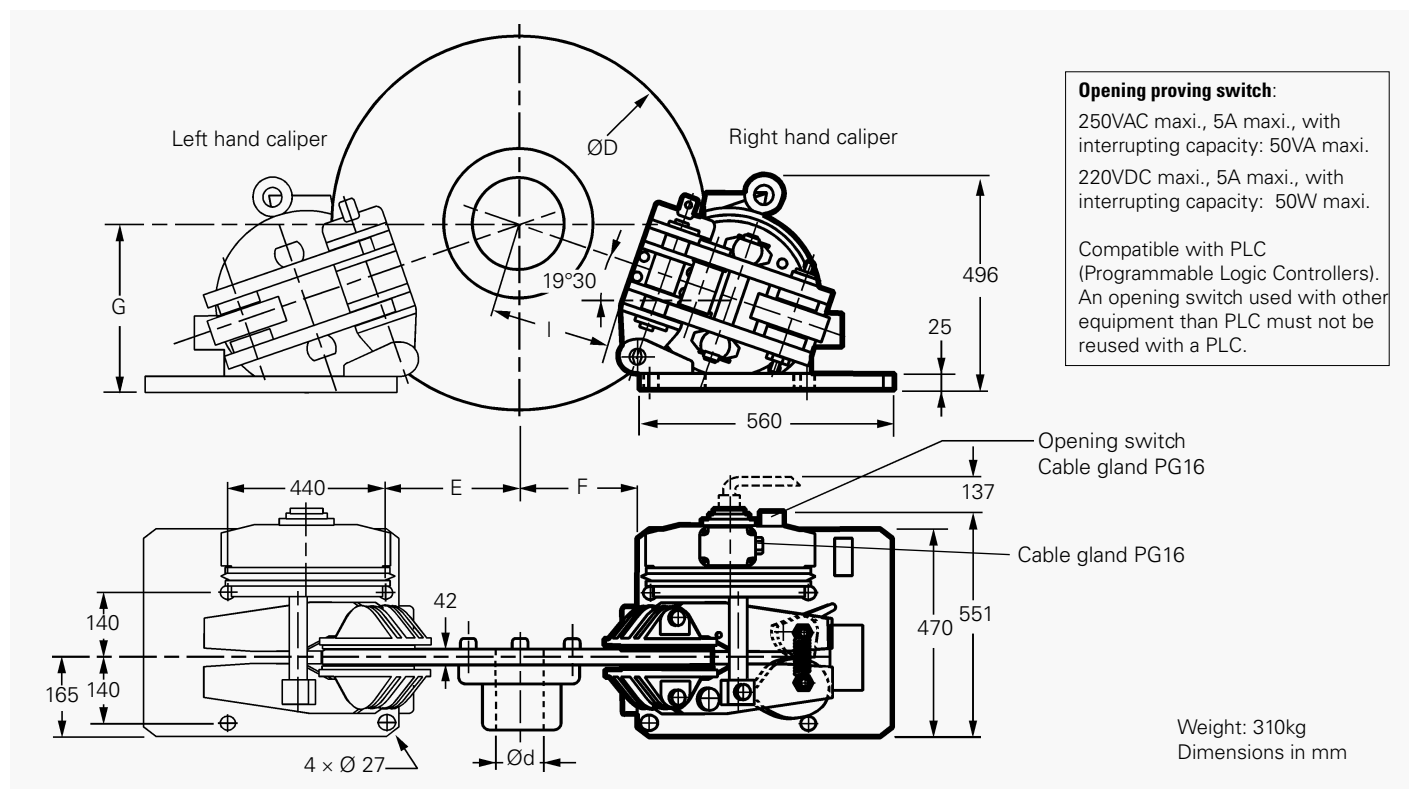
- Ambient temperature: -10°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ
- Other conditions, consult us.

Use:

Any application up to 600act/h

Options:

- Manual wear compensation
- Steelworks flameproof protection
- Marine protection
- Special paint



Discs		625	795	995
D	mm	625	795	995
d	mm	40-140	40-180	40-180
E	mm	157	250	345
F	mm	127	220	315
G	mm	353	385	415
I (approx. dimension)	mm	174	268	368

Response time at nominal torque: see the leaflet of the associated electrical power supply.

Discs		625	795	995
2CA2				
Nominal torque for 1 caliper adjustable from -30 to +20%	N.m	3 800	5 150	6 700
Maximum disc speed for nominal torque	r.p.m.	1 500	1 200	900
Maximum reaction on shaft	1 caliper N	18 600		
	2 calipers N	12 600		

Discs		625	795	995
1CA2				
Nominal torque for 1 caliper adjustable from -50 to 100%	N.m	6 610	8 800	11 370
Maximum disc speed for nominal torque	r.p.m.	310	250	200
Maximum reaction on shaft	1 caliper N	25 700		
	2 calipers N	16 300		

ELECTRICAL POWER UNITS

CALIPERS ASSOCIATION									
POWER UNITS	660	650	650E	645 - 45D	5D - 5DR	5DE	4CA2	3CA2	2CA2 - 1CA2
AC64 - ADC64									
AC32 - DC32									



MAIN CHARACTERISTICS

- DESIGNED TO GIVE OPTIMUM PERFORMANCE FROM THE ELECTROMAGNETIC CALIPERS
- AC LINE SUPPLY: AC64 AND AC32
- DC LINE SUPPLY: ADC64 AND DC32
- HIGH "CALL" VOLTAGE TO REDUCE OPENING RESPONSE TIME
- AUTOMATIC REDUCTION TO AN ECONOMICAL "HOLD" VOLTAGE
- A "CUT-OUT" CIRCUIT GIVING A VERY SHORT BRAKE ACTION



AC64 CA / AC32 CA

- Steel casing
- The caliper opening and closing are controlled by mains presence or not
- Max and Eco currents injected in the caliper(s) is regulated at values defined by the potentiometer PT1



AC64 CP / AC32 CP

- Polycarbonate casing
- The caliper opening and closing are controlled by mains presence or not
- Max and Eco currents injected in the caliper(s) is regulated at values defined by the potentiometer PT1



AC64 FB (CP or CA)

The AC64 FB power units are equipped with a FB card that ensures rapid brake closing, whatever the torque setting.



The module **MFB 230/500V** is optional.

It is especially designed to accelerate the closing of the brakes associated to the electrical power units **AC64-50, AC32-50, AC64-220 and AC32-220**.

Opening and closing of the caliper are controlled by the presence or not of the alternating power supply (230 to 500VAC +/-10%).

The **MFB** module when associated with a Stromag France power unit allows a fast closing of the associated brakes and this particularly when the braking torque is reduced. Consult us.

Service Brakes

ELECTRICAL POWER UNIT - AC64-50 / ADC64-50

Revision number: T04500-01-H

Revision date: 04.12.2024

Compact power supply for disc brakes with 50V coil type :

660/650-5K/5D-645-45K-4WD-4CA2

CP: Polycarbonate case IP66 IK08

CA: Steel case IP66 IK09

Ambient temperature:

- AC64-50 / AC64-50 700V: -20°C to +80°C
- ADC64-50 480V: -20°C to +60°C

Electrical Data:

AC64-50	Single or two-phase AC mains 220 to 500 VAC +/-10% 50/60Hz
AC64-50 700V	Two-phase AC mains 500 to 700 VAC +/-10% 50/60Hz
ADC64-50 480V	DC: 110 to 480 VDC +/-25% AC: 110 to 480 VAC +/-10%

EC marking of conformity:

- 2006/95/EC directive BT (standard EN60204-1)
- 2004/108/EC directive CEM (standards EN61000-6-2 EN61000-6-4)

Options:

- Closure delay of the caliper
- Disengageable closure delay of the caliper (cannot be combined with anti-condensation)
- Anti-condensation kit

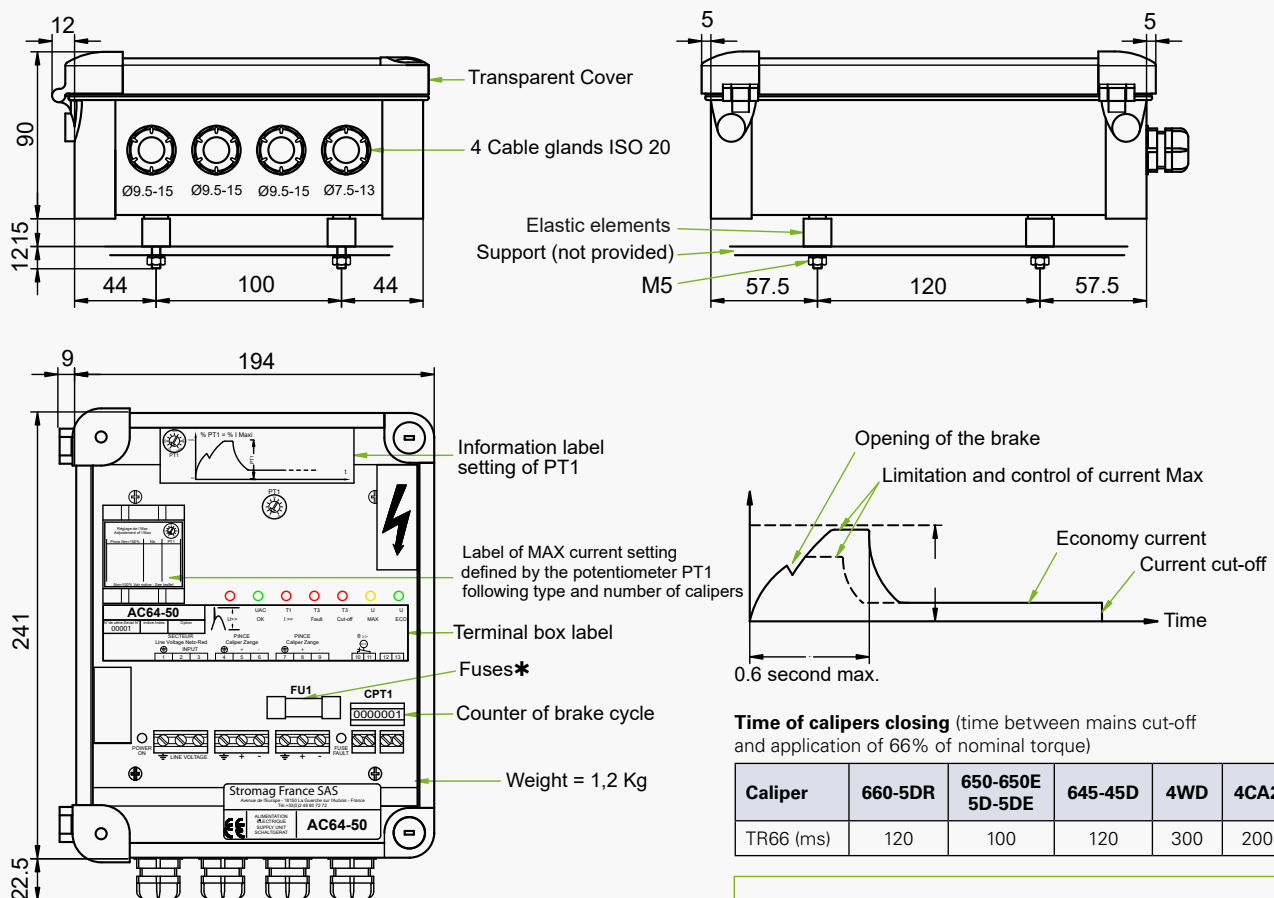
AC64-50 CA	PN. : 940-61030	from the index K
AC64-50 700V CA	PN. : 940-61800	from the index I
ADC64-50 480V CA	PN. : 940-62060	from the index J

AC64-50 CP	PN. : 940-60660	from the index K
AC64-50 700V CP	PN. : 940-61160	from the index I
ADC64-50 480V CP	PN. : 940-60690	from the index J

ELECTRICAL DANGER: THIS PRODUCT IS NOT INSULATED

Control and power electronic of power supply is not insulated and is under mains voltage. The power supply must be installed by qualified personnel, used to handle this equipment type and aware of risks inherent in their utilization.

POLYCARBONATE CASE - AC64-50 CP, AC64-50 700V CP and ADC64-50 480V CP



* Fuses

AC64-50	FU1 4A aM (10x38)
AC64-50 700V	FU1 4A aM 690VAC (10x38)
ADC64-50 480V	FU1 4A aM (10x38)

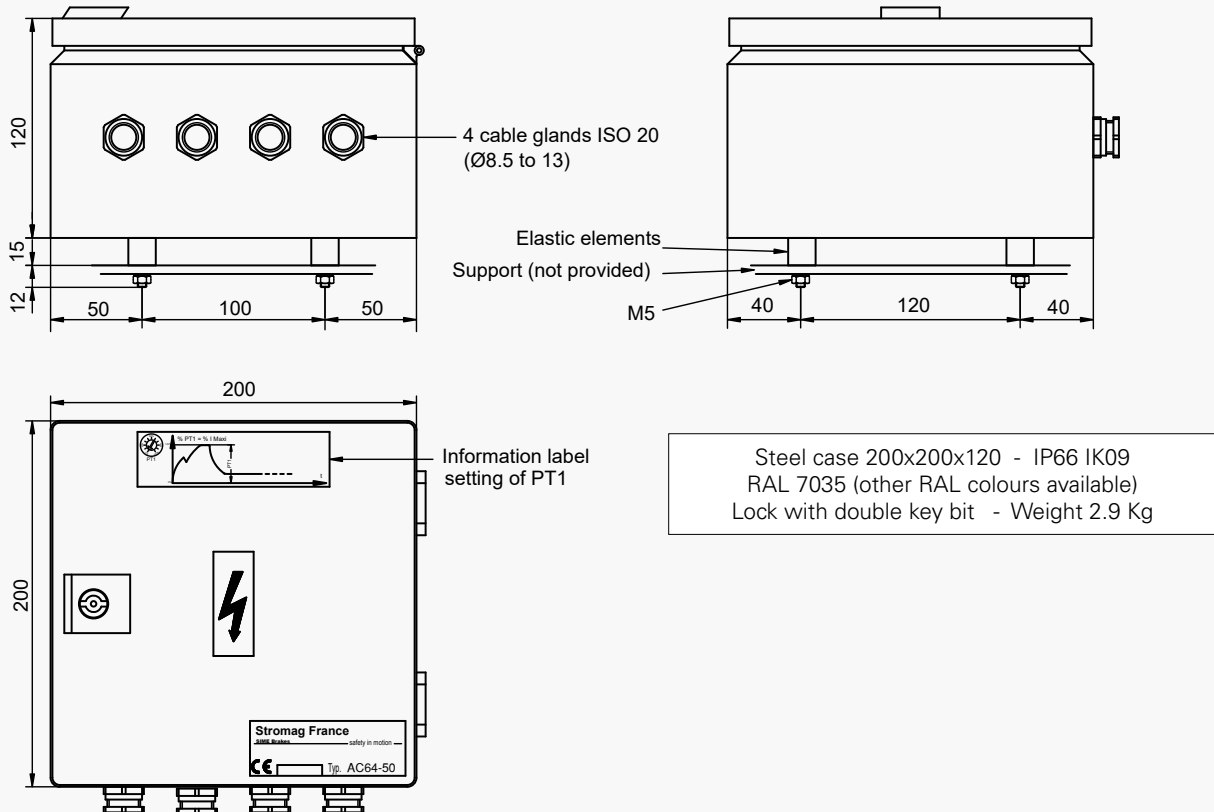
The power units **AC64-50 FB**, **AC64-50 700V FB** and **ADC64-50 480V FB** are designed to obtain a short closing time of the calipers at any torque setting, consult us.

ELECTRICAL POWER UNIT - AC64-50 / ADC64-50

Revision number: T04500-01-H

Revision date: 04.12.2024

STEEL CASE - AC64-50 CA, AC64-50 700V CA and ADC64-50 480V CA



CALIPER		660-650-650E		5D-5DR 5DE		645		45D		4WD		4CA2	
Maximum number of calipers		2		2		2		2		2		1	
Resistance at 20°C per caliper (Ω)		6,68		6,68		4,52		4,52		4,52		3,08	
Maximum number of actuations per hour and ambient temperature θ	θ ≤40°C	150		1000		150		1000		60		1000	
	40°C < θ ≤ 60°C	150		600		150		600		60		600	
	60°C < θ ≤ 80°C ■	150		300		150		300		60		300	
Power consumption per caliper	Max (W)	250		250		450		400		500		1000	
	Economy (W)	20		20		30		30		30		35	
Maximum return resistance of the cable connecting the caliper to the power supply (Ω)		2		2		1		1		1		1 *	
Max. length of the connecting cable (Power supply - caliper) for 1 caliper per cable, depending on cable section	2,5 mm² (m)	100		100		50		50		50		50 *	
	4 mm² (m)	160		160		80		80		80		80 *	
	6 mm² (m)	240		240		120		120		120		120 *	
Protection to be provided in head of control contactor on mains input	Number of caliper	1	2	1	2	1	2	1	2	1	2	1	
	Fuse aM (A)	1	2	1	2	2	4	2	4	2	4	4	
	Circuit-breaker curve C (A)	1	2	1	2	2	4	2	4	2	4	4	

■ **AC64-50 and AC64-50 700V only:** For applications with temperatures > 60°C, we recommend using the contact available on terminals 10-11 to detect any overheating of the power supply.

* If the ambient temperature of the caliper **4CA2** is higher than 60°C, the maximum return resistance and the maximum length of the connecting cable given in the above table must be divided by 2.

Service Brakes

ELECTRICAL POWER UNIT - AC32-50 CA

Revision number: T10005-01-G

Revision date: 11.06.2024

Compact power supply operating on alternating single or two-phase mains.
For SIME disc brakes with 50 V coil.
type: 4CA2 - 3WD - 3CA2 - 2CA2 - 1CA2
Steel case

Operating Conditions:

- Casing protection standard IP66 IK10
- Ambient temperature: -20°C to +60°C

Electrical Data:

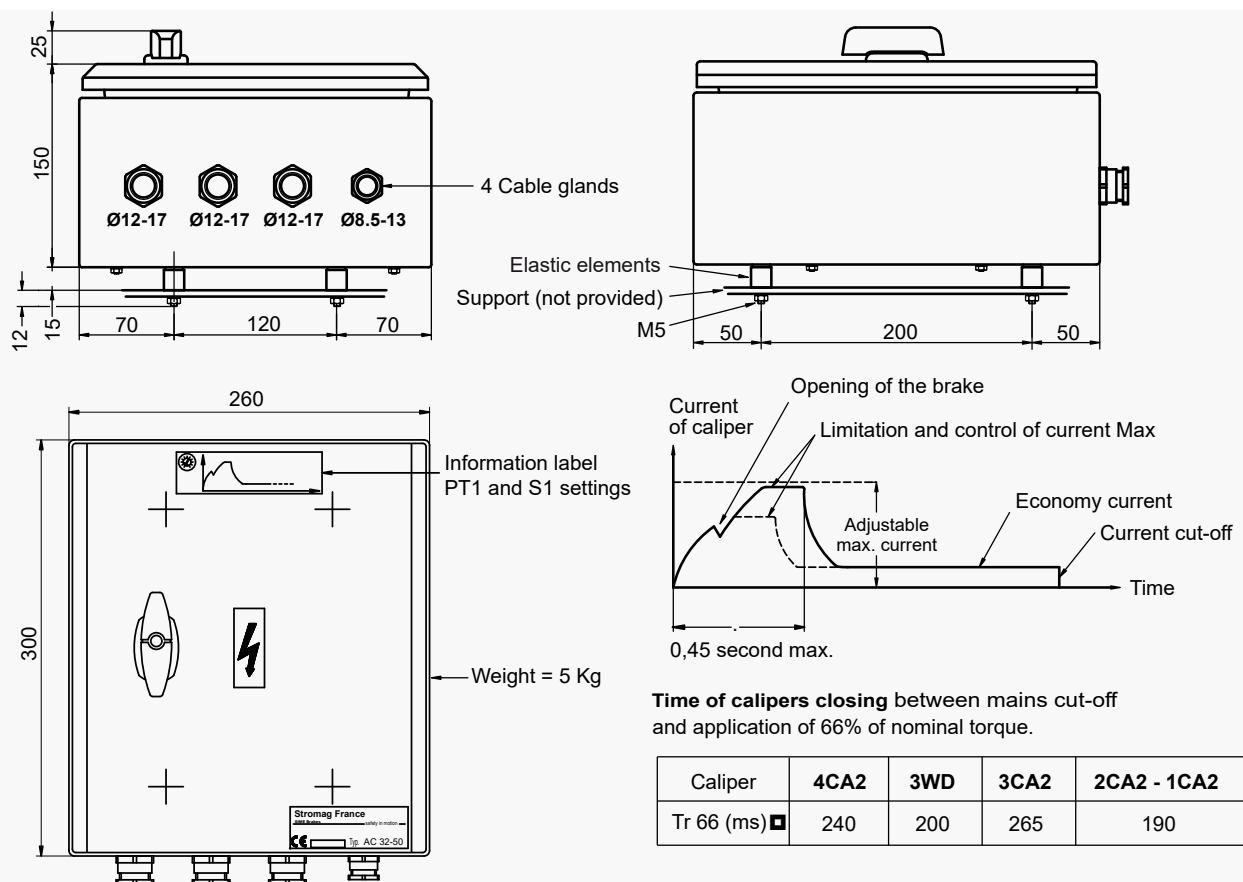
Single or two-phase mains AC
230 to 500V AC $\pm 10\%$ 50/60Hz

EC marking of conformity:

- 2006/95/CE directive Low Voltage (standard EN60204-1)
- 2004/108/CE directive EMC (standards EN61000-6-2 and EN61000-6-4)

Options:

- Closure delay of the caliper
- Disengageable closure delay of the caliper (cannot be combined with anti-condensation)
- Anti-condensation kit
- Polycarbonate case IP66 IK08
- DC32-50 power unit for DC mains



Caliper		4CA2	3WD	3CA2	2CA2 1CA2	2CA2 + 20% 1CA2 + 20%
Maximum number of calipers		2	1	1	1	
Resistance at 20°C per caliper		Ω	3.08	1.63	1.01	0.75
Maximum number of actuations per hour and ambient temperature θ	θ ≤ 40°C		1000	60	1000	600
	40°C < θ ≤ 60°C		600	60	600	300
Mains current absorbed per caliper	Max	A	9	16	20	28.2
	Economy	A	1	1.5	2	3.3
Maximum connecting cable return resistance between caliper and supply unit		Ω	1	0.75	1	0.5
Maximum connecting cable length (caliper-input) according to the cable section	2.5mm²	m	50	35	50	25
	4mm²	m	80	60	80	40
	6mm²	m	120	90	120	60
	10mm²	m	205	155	205	100
Protection to be provided in head of control contactor on mains input	Fuse aM	A	6	4	6	8
	Circuit-breaker curve C	A	8	6	10	12

ELECTRICAL POWER UNIT - AC32-50 CP

Revision number: T10005-01-G

Revision date: 11.06.2024

Compact power supply operating on alternating single or two-phase mains.
For SIME disc brakes with 50 V coil.
type: 4CA2 - 3WD - 3CA2 - 2CA2 - 1CA2
Polycarbonate case

Operating Conditions:

- Casing protection standard IP66 IK08
- Ambient temperature: -20°C to +60°C

Electrical Data:

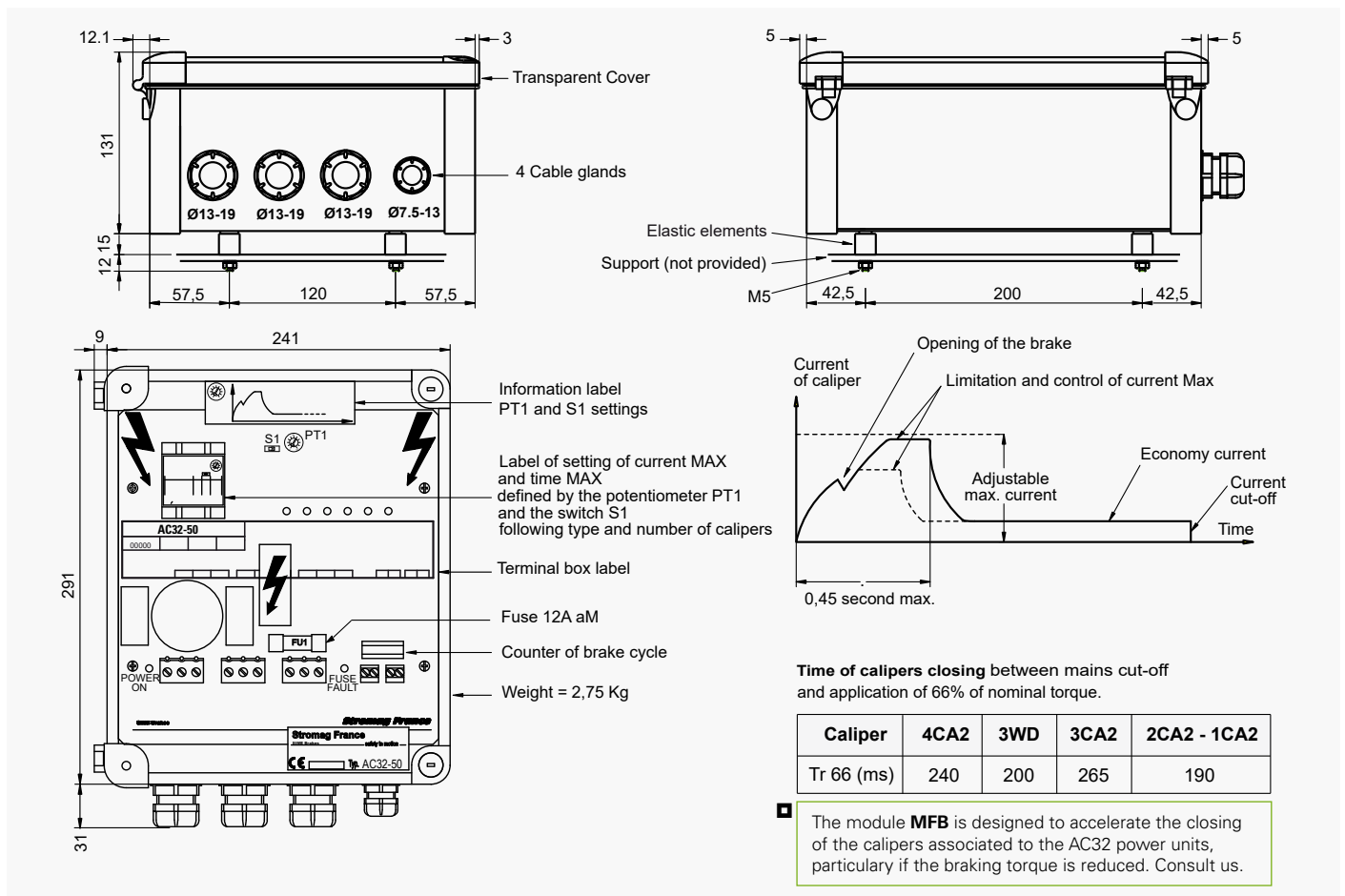
Single or two-phase mains AC
230 to 500V AC $\pm 10\%$ 50/60Hz

EC marking of conformity:

- 2006/95/CE directive Low Voltage (standard EN60204-1)
- 2004/108/CE directive EMC (standards EN61000-6-2 and EN61000-6-4)

Options:

- Closure delay of the caliper
- Disengageable closure delay of the caliper (cannot be combined with anti-condensation)
- Anti-condensation kit
- Steel case IP66 IK10
- DC32-50 power unit for DC mains



ELECTRICAL DANGER: THIS PRODUCT IS NOT INSULATED

Control and power electronic of power supply is not insulated and is under mains voltage. The power supply must be installed by qualified personnel, used to handle this equipment type and aware of risks inherent in their utilization.

THRUSTER SERVICE BRAKES

APPLICATIONS

- | | |
|--|--|
| <ul style="list-style-type: none">• PORT CRANES• HOIST, GANTRY AND TROLLEY MOTIONS• BELT CONVEYORS• MINES | <ul style="list-style-type: none">• IRON AND STEEL INDUSTRY• LADLE CRANES |
|--|--|



MAIN CHARACTERISTICS	OPTIONS
• FAILSAFE BRAKES • SPRING APPLIED • ELECTROHYDRAULIC THRUSTER RELEASED • ADJUSTABLE BRAKING TORQUE	• LINING FULL WEAR CONTROL SWITCH • HIGH TEMPERATURE STEEL WORKS (SIDHT) • HIGH TEMPERATURE THRUSTER (SW)



PT thrusters

- Electro-hydraulic actuator: conversion of electric power in hydraulic power which is converted via a piston in mechanical force.
- A complete range:
PT 230/5 - PT 300/5 - PT 500/6 - PT 800/6 - PT 1210/6 - PT 2010/6 - PT 3010/6



TDXB - TDXB-SioT

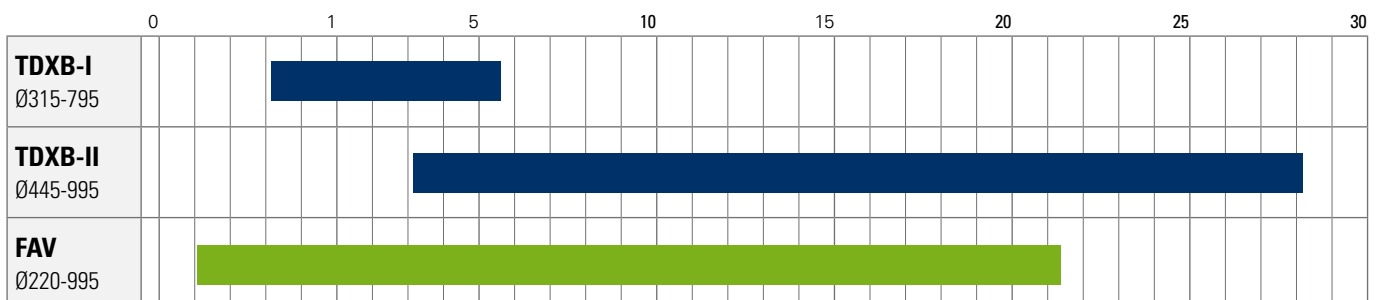
- Designed for heavy duty operations such as steel works
- Symetric and compact design
- Robust construction
- TDXB-SioT for monitoring and predictive maintenance



FAV

- Designed for heavy duty operations such as dockside or mines applications
- A complete range with various spring/thrusters combinations
- Symetrical design for easy mounting

Braking Torque (kN.m)



ELECTRO-HYDRAULIC THRUSTERS - PT SERIES

Revision number: MCC-9-8929-SG

Revision date: 15.11.2024

CHARACTERISTICS

- DIN 15430 design compliant
- Short actuating time (<400 ms)
- Operating temperature range from -20°C to +70°C
- High switching frequency of up to 1200 cycles per hour
- S3-60 % duty cycle
- Bi-directional motor, no changeover contactors required
- Easy to install
- Overloading not possible during operation
- Manual external limiting of the stroke
- Stepless regulation from 400 micro seconds to 8 seconds for slow braking/release above PT 300 (AV/DV)

- Flip thruster body above PT 500 (90/180 degrees)
- IloT Integration on request
- Non-Standard strokes on demand
- CE certified

MOTOR

- Three-phase asynchronous motor, 2-pole
- Standard Insulation Class H

VOLTAGE AND FREQUENCIES

- 230/420 V, 50 Hz, 3 Phase
- 380 V, 50 Hz, 3 Phase
- 460 V, 60 Hz, 3 Phase
- All devices are star (Y) connected on delivery
- For special voltage, contact us.

TERMINAL BOX

- Protection class IP66
- Cable gland PG16 for cable up to 4 x 2.5 mm² (Ø17-19 mm)

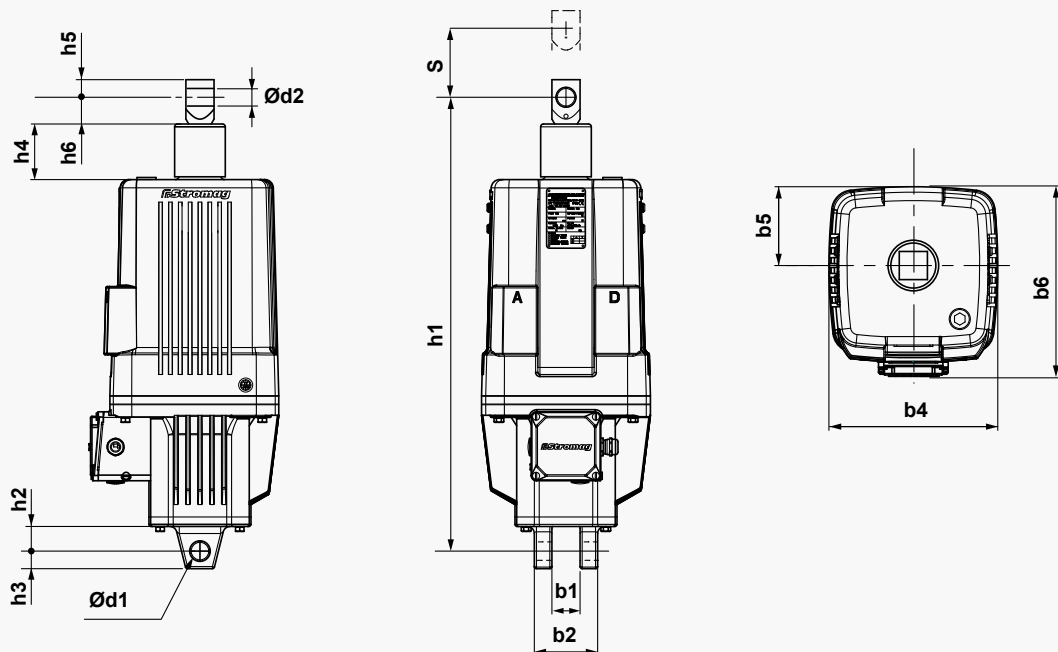
PROTECTIONS

- Corrosion protection class C5-H on demand
- Standard Protection class C3-M
- Standard Color RAL 9007

OPERATING FLUID

- Oil grade: Shell Heat Transfer Oil S2 or Hydraulic Oil HLP 32
- Low Temp Application : Shell Morlina 10

DIMENSIONS



Thruster Type PT	S	b1	b2	b3	b4	b5	b6	d1	d2	h1	h2	h3	h4	h5	h6
PT 230/5	50	40	80	20	160	-	197	16	12	286	20	16	-	12	26
PT 300/5	50	40	80	25	160	-	197	16	16	370	20	16	-	15	44
PT 500/6	60	60	120	30	195	-	245	20	20	435	23	22	-	18	42
PT 800/6	60	60	120	30	195	-	245	20	20	450	23	22	-	18	57
PT 1210/6	60	40	90	40	240	112	268	25	25	645	35	25	117	25	38
PT 2010/6	60	40	90	40	240	112	268	25	25	645	35	25	117	25	38
PT 3010/6	60	40	90	40	240	112	268	25	25	645	35	25	117	25	38

ELECTRO-HYDRAULIC THRUSTERS - PT SERIES

Revision number: MCC-9-8929-SG

Revision date: 15.11.2024

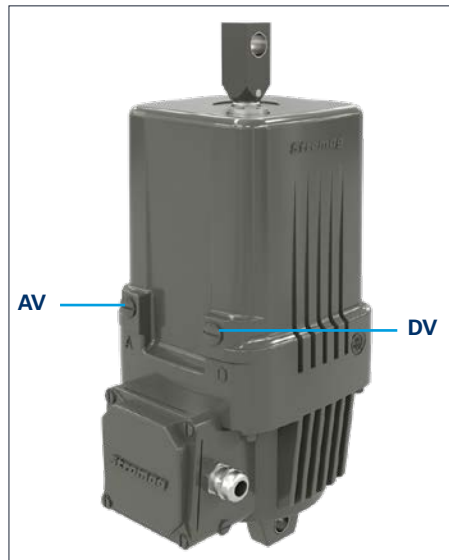
TECHNICAL DATA

PT Thruster	Force N	Nominal Stroke mm	Optional Stroke mm	Duty Rating at S3 -60% duty cycle/Hrs	Oil Volume L	Weight (without oil) Kg
PT 230/5	230	50	60	1200	1.2	12
PT 300/5	300	50	60	1200	1.7	14
PT 500/6	500	60	80	1200	3.4	22
PT 800/6	800	60	80	1200	3.4	23
PT 1210/6	1210	60	80, 100, 120	1200	6.8	39
PT 2010/6	2010	60	80, 100, 120	1200	6.8	39
PT 3010/6	3010	60	80, 100, 120	1200	6.8	40

OPTIONS

AV	Ascent valve
DV	Descent valve

Stepless regulation from 400 micro seconds to 8 seconds for slow braking/release above PT 300 (AV/DV).



IS	Inner spring
----	--------------

- The thrusters PT with inner spring option has identical overall dimensions as the standard thrusters
- Fixed breaking torque, no external spring needed
- Customer specific spring for fixed braking torque available on demand.

Thruster PT	Nominal Force (without Inner spring) N	Spring Force (Max) N
PT 230/5	230	180
PT 300/5	300	270
PT 500/6	500	460
PT 800/6	800	750
PT 800/12	800	750
PT 1210/6	1210	1200
PT 1210/12	1210	1200
PT 2010/6	2010	1900
PT 2010/12	2010	1900
PT 3010/6	3010	2700
PT 3010/12	3010	2700

SW	High temperature
----	------------------

- PT thrusters with high temperature option are filled with Shell Heat Transfer Oil S2 suitable for high temperatures (up to +70°C)
- They are fitted with seals allowing them to withstand the higher environmental temperatures
- Max. working temperature: 90°C at the peak < 10 minutes 3 times per hour maximum.

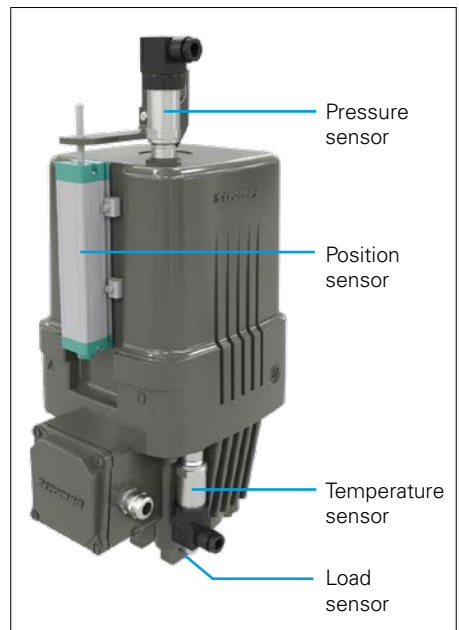
SV	Special voltage
----	-----------------

Special voltage range available from 110 to 690 VAC 3 Phase, 50 Hz or 60 Hz on request.

PE	Special paint
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PT thrusters with customer specific paint are available on request.

Sensors



Cable gland positions



Service Brakes

DISC BRAKE - TDXB-SIOT BRAKES

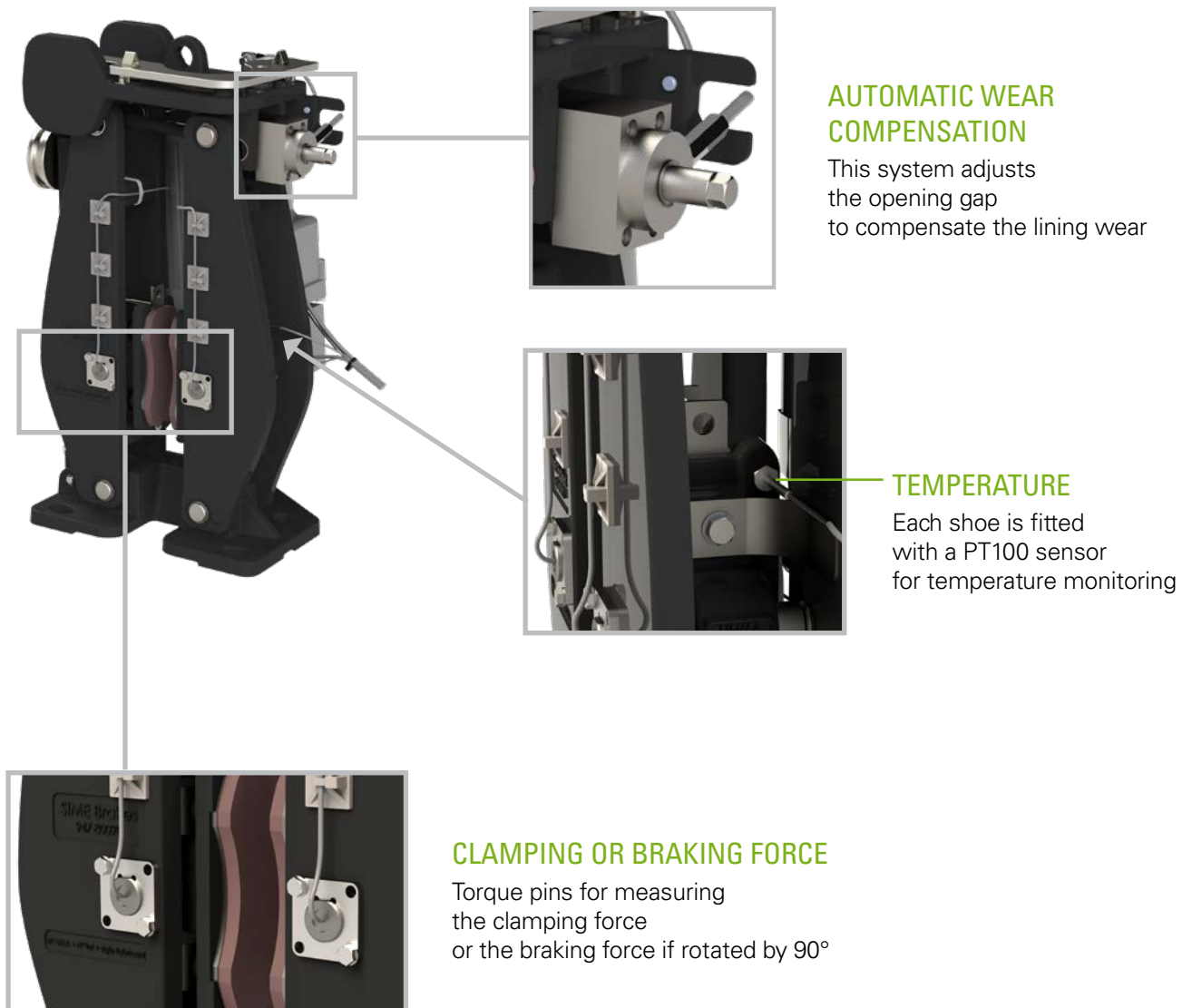
Revision number: A10121-01-A

Revision date: 06.12.2021

SiIoT concept includes several modules, each having specific functions:

TDXB - SiIoT brakes are fitted with sensors, that enables a complete monitoring of the brake operation.

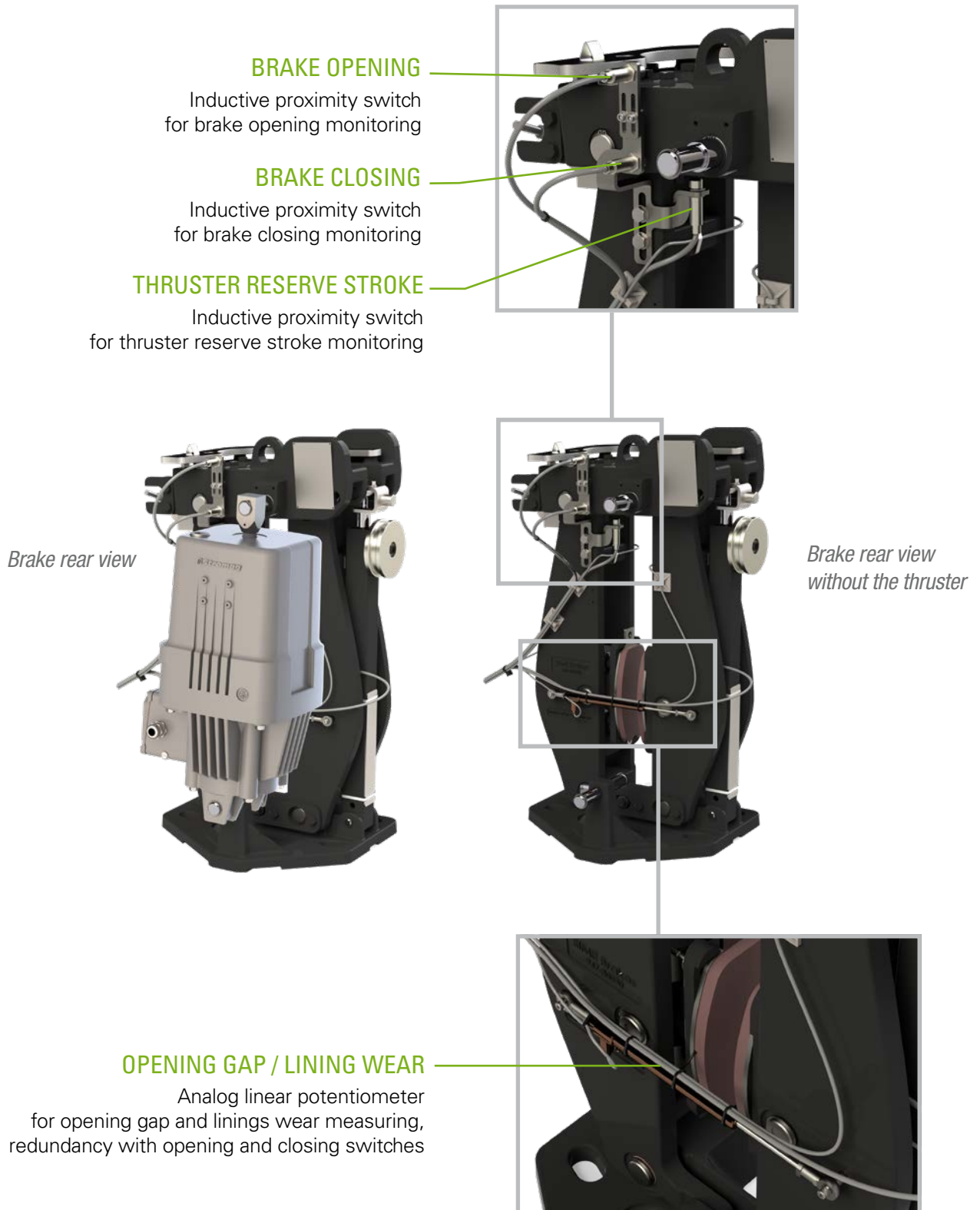
Data are processed by the **SiBrake** module and transmitted to the monitoring center by the **SiNet** module for a predictive maintenance of the installation. This reduces maintenance costs and allows a better management of the production (less downtime).



DISC BRAKE - TDXB-SIOT BRAKES

Revision number: A10121-01-A

Revision date: 06.12.2021



Service Brakes

DISC BRAKE - TDXB-I BRAKE

Revision number: T10121-01-I

Revision date: 16.03.2023

Fail safe

Spring application / Thruster release

Self-centering

Automatic lining wear compensation

Opening sensor

Low maintenance Teflon bushes

Lining full wear indicators

Manual release lever

Lining pads with DIN shape / Thrusters **TS**

Operating conditions:

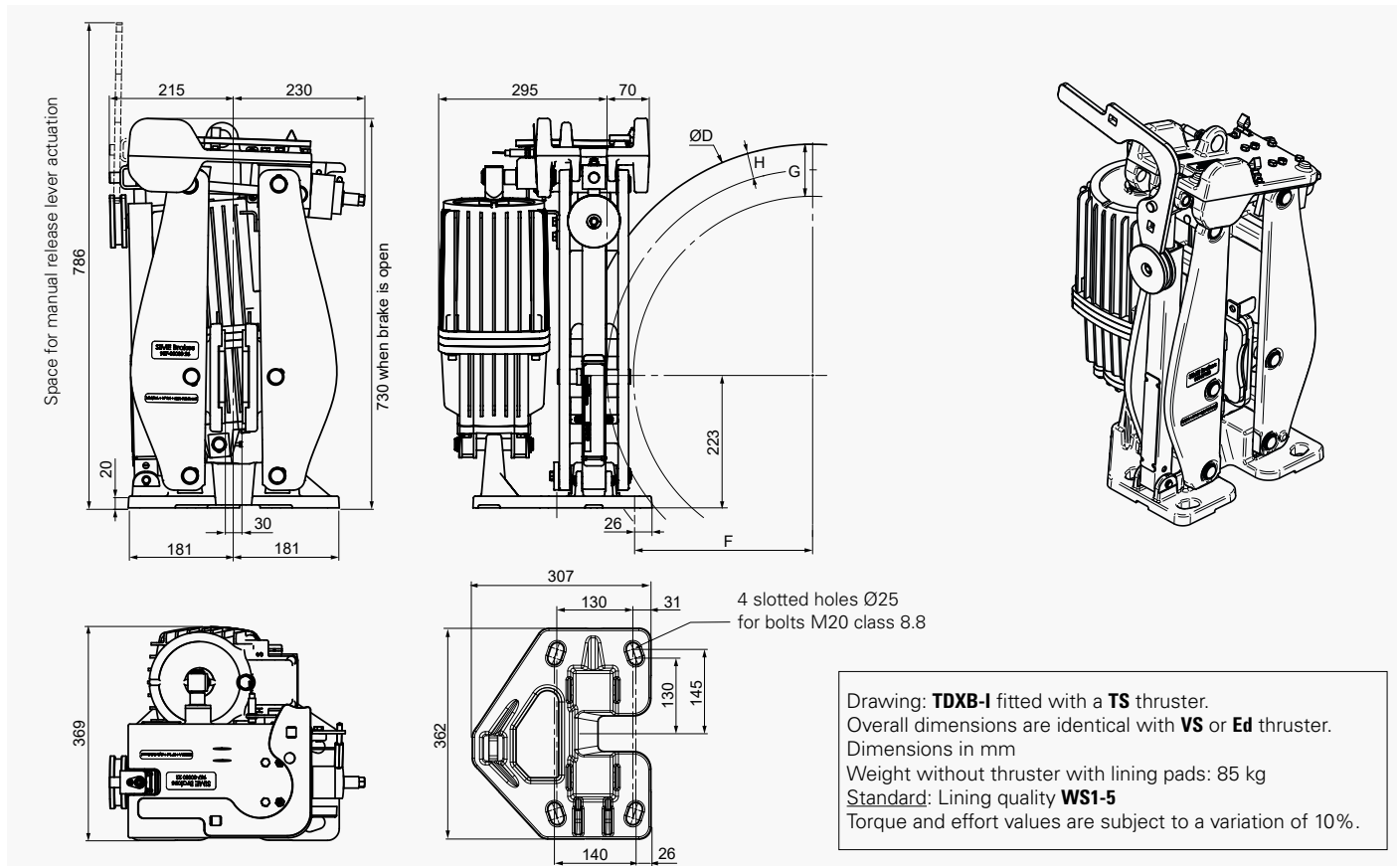
- Ambient temperature: -25°C to +50°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ
- Other conditions: consult us.

Use:

- Service brake

Options:

- Closing sensor
- Thruster limit stroke sensor
- Special voltage
- Custom color
- Thruster **VS** or **Ed**
- Inductive sensors DC-AC 24-240V 50/60 Hz



DISCS (ØD)			315	355	395	445	495	550	625	705	795
NOMINAL TORQUE. 1 caliper *	TDXB-I 1	N.m	901	996	1104	1267	1437	1619	1877	2148	2453
	TDXB-I 2	N.m	1490	1646	1826	2094	2374	2677	3102	3550	4054
	TDXB-I 3	N.m	2075	2293	2543	2917	3307	3728	4321	4945	5647
MAXIMUM DISC SPEED for nominal torque **		rpm	3000	2700	2400	2100	1900	1800	1500	1350	1200
Maximum linear speed		m/s	50								
F		mm	57	70	80	100	125	155	190	230	275
G		mm	94.5	101.5	111.5	116.5					
H		mm	27	31	36	40.2					
MAXIMUM REACTION ON SHAFT	TDXB-I 1	N	6776								
	TDXB-I 2	N	11200								
	TDXB-I 3	N	16000								

* Nominal torque is adjustable from 100% to 70%

** For higher speeds, consult us

DISC BRAKE - TDXB-II BRAKE

Revision number: T10122-01-I

Revision date: 02.05.2022

Fail safe
Spring application / Thruster release
Self-centering
Automatic lining wear compensation
Opening sensor
Low maintenance Teflon bushes
Lining full wear indicators
Manual release lever
Thrusters **TS**

Operating conditions:

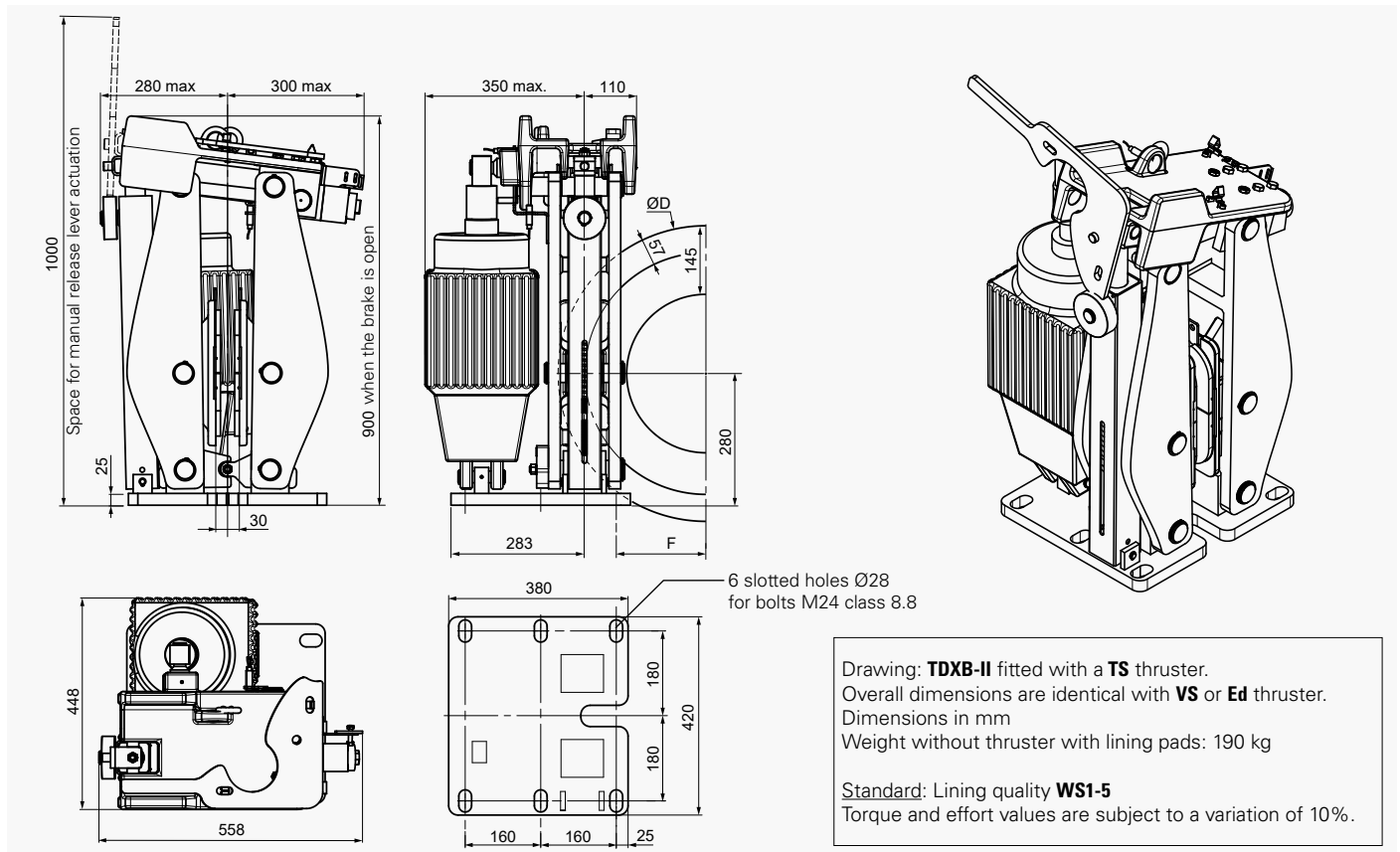
- Ambient temperature: -25°C to +50°C
 - Relative humidity ≤ 70%
 - Dust in atmosphere ≥ 65μ
- Other conditions: consult us.

Use:

- Service brake

Options:

- Closing sensor
- Thruster limit stroke sensor
- Special Voltage
- Custom color
- Thruster **VS** or **Ed**
- Inductive sensors DC-AC 24-240V 50/60 Hz



DISCS (ØD)			445	495	550	625	705	795	995
NOMINAL TORQUE. 1 caliper *	TDXB-II 1	N.m	4502	5182	5930	6950	8038	9262	11982
	TDXB-II 2	N.m	5958	6858	7848	9198	10638	12258	15858
	TDXB-II 3	N.m	7944	9144	10464	12264	14184	16344	21144
	TDXB-II 4	N.m	10592	12192	13952	16352	18912	21792	28192
MAX. DISC SPEED for nominal torque **		rpm	2100	1930	1740	1530	1354	1200	960
Maximum linear speed		m/s	50						
F		mm	93	118	145	183	255	268	368
		mm	D/2-129.5						
MAXIMUM REACTION ON SHAFT	TDXB-II 1	N	27200						
	TDXB-II 2	N	36000						
	TDXB-II 3	N	48000						
	TDXB-II 4	N	64000						

* Nominal torque is adjustable from 100% to 70%

** For higher speeds, consult us

Service Brakes

DISC BRAKE - FAV10-FAV15 BRAKES

Revision number: T10022-011-I

Revision date: 25.11.2024

Fail safe
Spring application / Thruster release
Manual centering
Lining wear compensation
Linings with wear indicator wires
Thruster stroke control switch
Opening proving switch
Stainless steel pins
Manual release lever

Operating conditions:

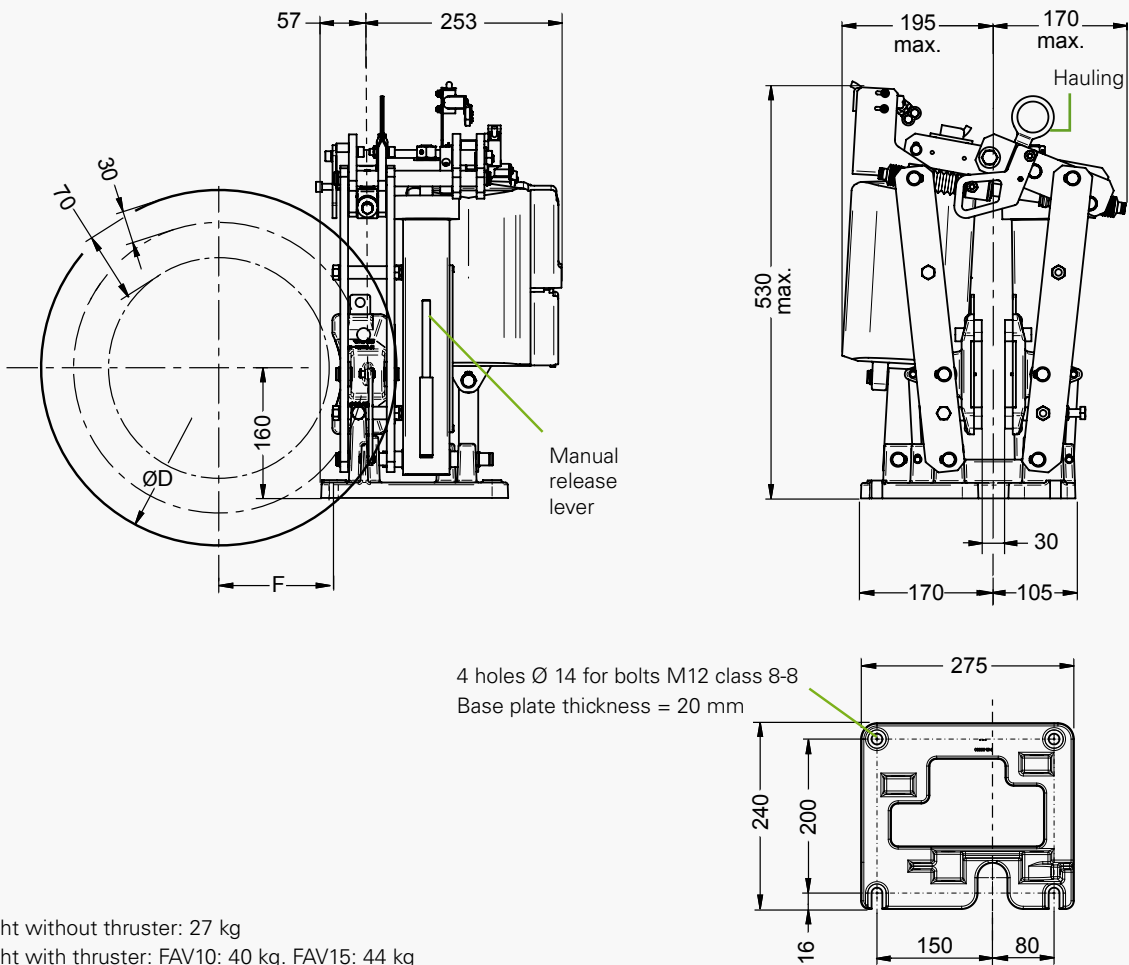
- Ambient temperature: -20°C to +70°C
- Relative humidity ≤ 90%
- Other conditions: consult us.

Use:

- Service brake

Option:

- Linings full wear control switch



Weight without thruster: 27 kg
Weight with thruster: FAV10: 40 kg. FAV15: 44 kg

Caliper	Clamping force [N] ±5% *	Discs (ØD) [mm]	220	250	280	315	355	400	450	500	550
FAV10	3900	Mb [Nm] μ=0.4 ◆	250	300	340	400	460	530	610	690	760
FAV15	4700		300	360	410	480	560	640	730	830	920
Max. disc speed ** rpm			4300	3800	3400	3000	2700	2300	2100	1900	1700
Distance F mm			47	62	77	93	113	137	162	187	212

* Clamping force: Factory setting adjustable from 100% to 70%.

♦ The actual friction level/coefficient is dependent upon inertia, pad surface pressure and rubbing speed.

** For higher speeds, consult us.

DISC BRAKE - FAV21 BRAKES

Revision number: T10044-021-F

Revision date: 25.11.2024

Fail safe
Spring application / Thruster release
Auto centering
Lining wear compensation
Linings with wear indicator wires
Thruster stroke control switch
Opening proving switch
Manual release lever
Stainless steel pins

Operating conditions:

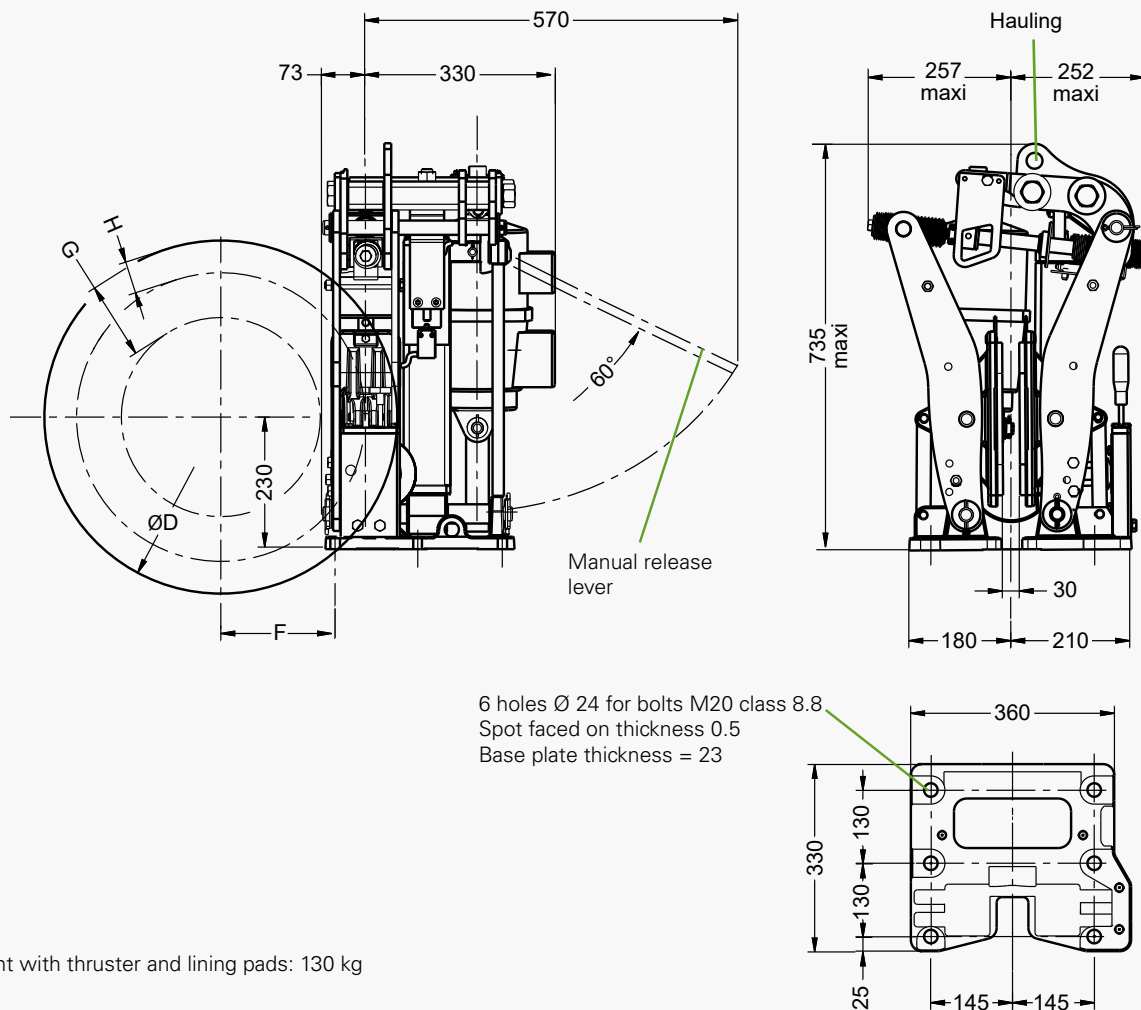
- Ambient temperature: -20°C to +70°C
 - Relative humidity ≤ 90%
- Other conditions: consult us.

Use:

- Service brake

Option:

- Lining full wear control switch



Weight with thruster and lining pads: 130 kg

Caliper	Clamping force [N] ±5% *	Discs (ØD) [mm]	355	400	450	500	560	630	710
FAV213	17000	Mb [Nm] μ=0.4 ♦	1650	1950	2300	2650	3050	3500	4050
FAV212	12800		1250	1450	1700	2000	2300	2650	3050
FAV211	6600		650	750	900	1000	1200	1350	1600
Max. disc speed **		rpm	2700	2400	2100	1900	1800	1500	1500
Distance F		mm	122	142	118	143	170	208	248

* Clamping force: Factory setting adjustable from 100% to 70%.

♦ The actual friction level/coefficient is dependent upon inertia, pad surface pressure and rubbing speed.

** For higher speeds, consult us.

Service Brakes

DISC BRAKE - FAV40 BRAKES

Revision number: T03520-021-A

Revision date: 25.11.2024

Fail safe
Spring application / Thruster release
Auto centering
Lining wear compensation
Linings with wear indicator wires
Thruster stroke control switch
Opening proving switch
Manual release lever
Stainless steel pins

Operating conditions:

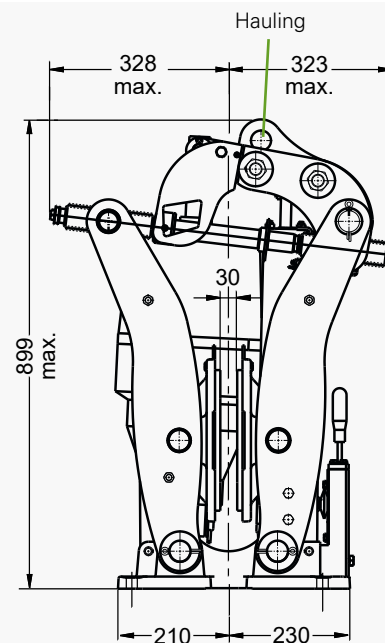
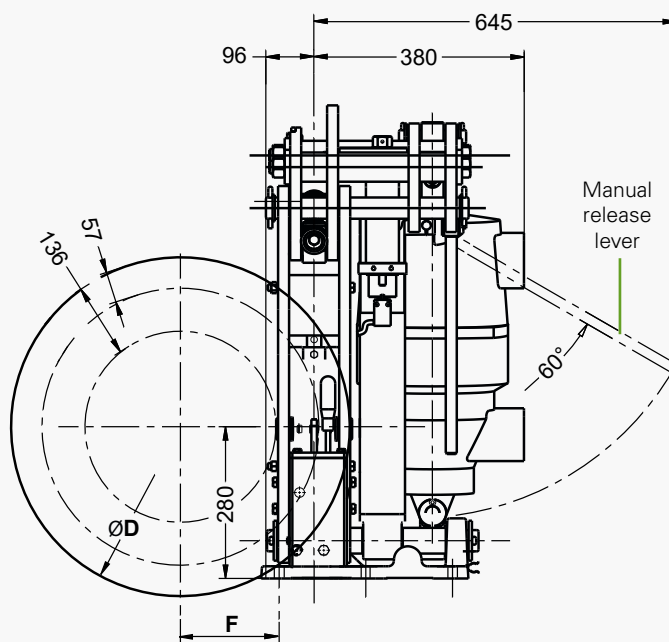
- Ambient temperature: -20°C to +70°C
- Relative humidity ≤ 90%
- Other conditions: consult us.

Use:

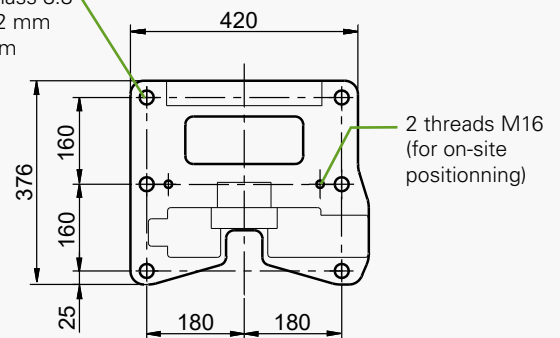
- Service brake

Option:

- Lining full wear control switch=



6 holes Ø 26 for bolts M24 class 8.8
Counterbore Ø52 thickness 2 mm
Base plate thickness = 25 mm



Weight without thruster: 180 kg
Weight with thruster: 222 kg

Caliper	Clamping force [N] ±5% *	Discs (ØD) [mm]	450	500	560	630	710	800	1000
FAV 403	47500	Mb [Nm]	6400	7300	8500	9800	11300	13000	16800
FAV 402	32300	μ=0.4 ♦	4300	5000	5800	6700	7700	8900	11500
FAV 401	20100		2700	3100	3600	4100	4800	5500	7100
Max. disc speed **		rpm	2100	1900	1700	1500	1300	1200	900
Distance F		mm	93	118	145	183	223	268	368

* Clamping force: Factory setting adjustable from 100% to 70%.
♦ The actual friction level/coefficient is dependent upon inertia, pad surface pressure and rubbing speed.
** For higher speeds, consult us.

DISC BRAKE - FAV50 BRAKES

Revision number: T03525-021-E

Revision date: 25.11.2024

Fail safe
Spring application / Thruster release
Auto centering
Lining wear compensation
Linings with wear indicator wires
Thruster stroke control switch
Opening proving switch
Manual release lever
Stainless steel pins

Operating conditions:

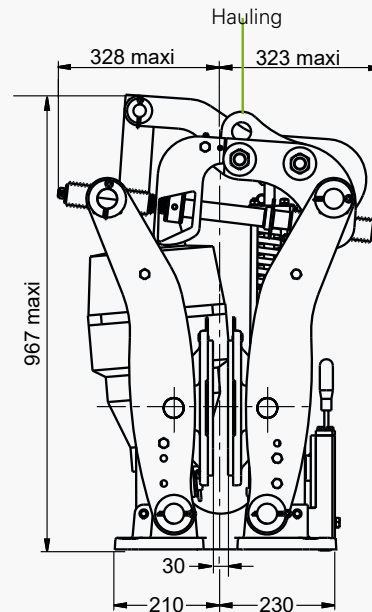
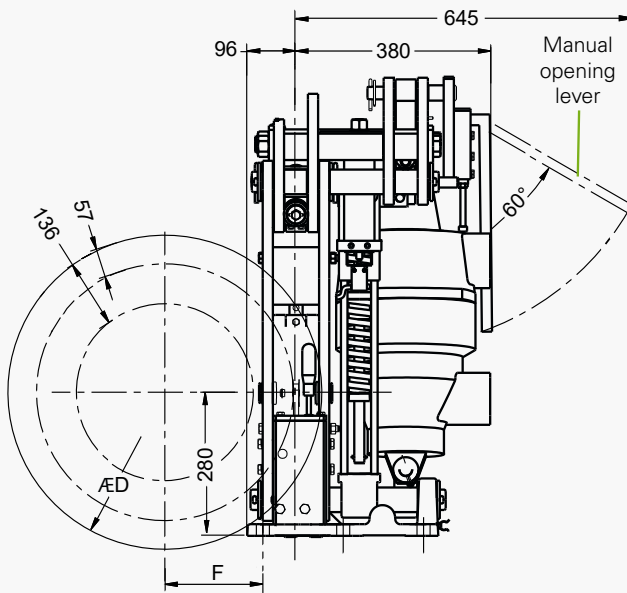
- Ambient temperature: -20°C to +70°C
- Relative humidity $\leq 90\%$
- Other conditions: consult us.

Use:

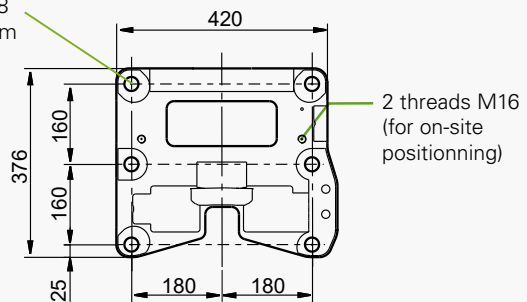
- Service brake

Option:

- Lining full wear control switch



6 holes Ø 28 for bolts M24 class 8.8
Spot faced on Ø28 thickness 0.5 mm
Base plate thickness = 24 mm



Weight without thruster: 180 kg
Weight with thruster: 224 kg.

Caliper	Clamping force [N] $\pm 5\%$ *	Discs (ØD) [mm]	630	710	800	1000
FAV 503	61700	Mb [Nm] $\mu=0.4$ ♦	12700	14700	16900	21900
Max. disc speed **		rpm	1500	1300	1200	900
Distance F		mm	183	223	268	368

* Clamping force: Factory setting adjustable from 100% to 70%.

♦ The actual friction level/coefficient is dependent upon inertia, pad surface pressure and rubbing speed.

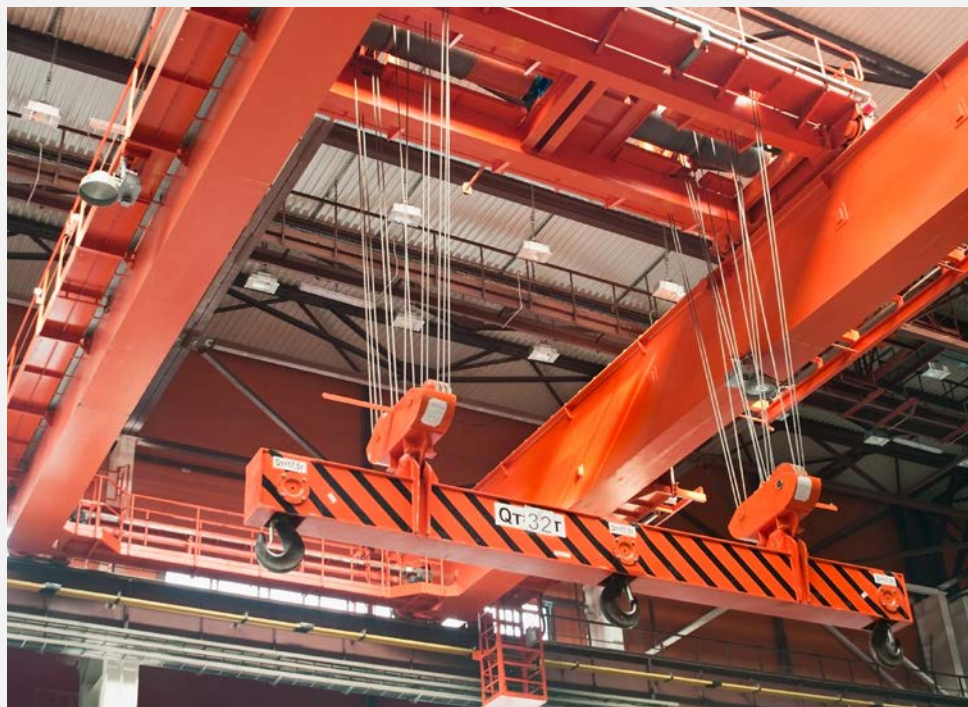
** For higher speeds, consult us.

DRUM BRAKES

APPLICATIONS

- MINING
- HYDRO POWER
- OIL & GAS
- HARBOUR & SHIPPING

- STEEL
- POWER
- CEMENT



MAIN CHARACTERISTICS	OPTIONS
• BRAKING WITHOUT ENERGY BY SPRING APPLICATION • OPENING BY ELECTROHYDRAULIC THRUSTER OR BY ELECTROMAGNET (FEM) • ADJUSTABLE BRAKING TORQUE	• OPENING PROVING SWITCH • FULL LINING WEAR INDICATORS • HAND RELEASE LEVER • HIGH TEMPERATURE, SPECIAL PROTECTION, DELAY. ...



SDB

- Spring application
- Thruster release
- Standard DIN 15435
- Protection level C4M



SAB

- Spring application
- Thruster release
- Standard AISE N.11 - 63.120
- Protection level C4M



FNS-PT

- Spring application
- Thruster release
- Standard DIN 15435
- Protection level C3M



FNS-VS-T

- Spring application
- Thruster release
- Horizontal spring and thruster
- Standard DIN 15435



FED-A

- Spring application (Horizontal spring)
- Thruster release
- Standard SIME™
- Protection level C3M



FEM-A

- Spring application (Horizontal spring)
- Electromagnet release
- Standard SIME™
- Association with AFM and DFM power supplies

Service Brakes

DRUM BRAKE - SDB BRAKES

Revision number: MCC-P-8928-SG

Revision date: 15.11.2024

Standard DIN 15435

- Spring application braking
- Thruster release
- Standard voltage 230/420 VAC 50Hz
- Protection class C5-H available on demand
- Automatic lining wear compensation
- Brake shoe auto-aligning device
- Scale for torque adjustment

- Brake lever synchronization
- Aluminium shoes with non abestos organic linings
- Self lubricated bushings at main hinge points
- All exposed steel parts are with Zinc Al Flake coating on demand

Operating conditions

- Ambient temperature: -20°C to 70°C
- Max permissible relative humidity 90%
- IP rating: IP66



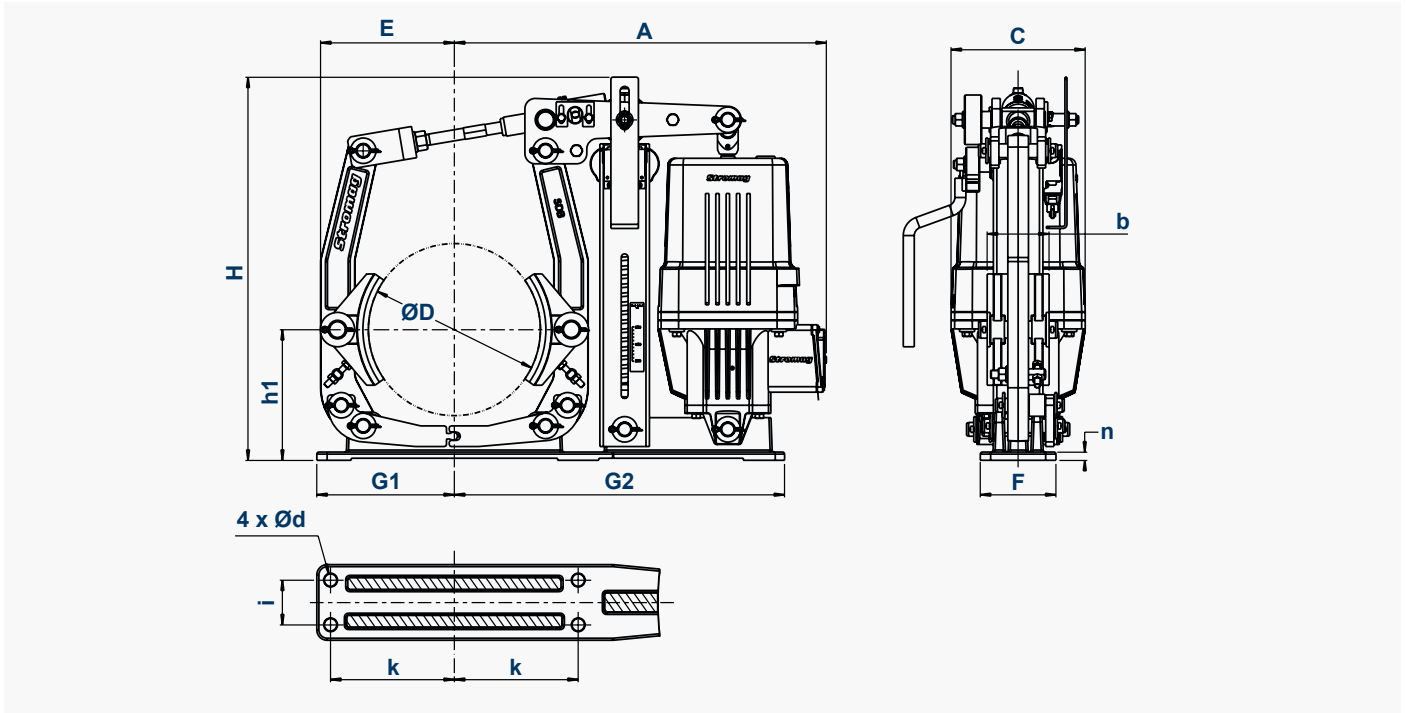
Options:

AV - DV thruster	Thruster delay: Ascent Valve or Descent Valve
BELS	Brake engaging Limit Switch
BRLS	Brake release Limit Switch
HRL	Hand release lever
HRLM	Limit Switch for hand release monitoring
LWI	Full lining wear indicators
SPA	Paint according to customer specification
SV	Special Voltage
PC	Corrosion class C5-H

DRUM BRAKE - SDB BRAKES

Revision number: MCC-P-8928-SG

Revision date: 15.11.2024



BRAKE TYPE	Thruster	TORQUE (N.m.)		WEIGHT (kg)	DIMENSIONS (mm)													
		min.	max.		A	b	C	D	d	E	F	G1	G2	H	h1	i	k	n
SDB 160	PT 230/5	80	180	28	428	65	160	160	14	140	85	145	355	418	160	55	130	8
SDB 200	PT 230/5	110	260	35	470	70	160	200	14	172	90	165	415	490	160	55	145	10
	PT 300/5	140	380	38														
SDB 250	PT 230/5	140	300	45	533	90	160	250	18	202	110	200	480	583	190	65	180	12
	PT 300/5	180	410	48														
	PT 500/6	300	800	53	570		195											
SDB 315	PT 230/5	180	350	70	670	110	160	315	18	253	115	245	535	585	230	80	220	14
	PT 300/5	250	500	70														
	PT 500/6	315	970	75			195											
	PT 800/6	630	1600	80														
SDB 400	PT 500/6	400	1050	138	695	140	195	400	22	310	160	310	615	715	280	100	270	14
	PT 800/6	630	1700	140														
	PT 1210/6	1000	2650	155	810		240							775				
SDB 500	PT 800/6	800	2060	176	925	180	195	500	22	380	180	365	752	803	340	130	325	21
	PT 1210/6	1250	3270	204														
	PT 2010/6	2000	5150	204			204							830				
SDB 630	PT 1210/6	1800	3780	310	1150	225	240	630	27	465	220	450	870	1025	420	170	400	20
	PT 2010/6	2500	6000	310														
	PT 3010/6	4000	8500	315														
SDB 710	PT 2010/6	3150	6000	435	1180	225	240	710	27	520	240	500	870	1135	470	190	450	25
	PT 3010/6	5000	9600	441														

Service Brakes

DRUM BRAKE - SAB BRAKES

Revision number: T10110-02-I

Revision date: 27.03.2025

Standard AISE N. 11 - 63.120

- Spring application braking
- Thruster release
- Standard voltage 230/460 VAC 60Hz
- Protection class C5-H available on demand
- Automatic lining wear compensation
- Brake shoe auto-aligning device

- Scale for torque adjustment
- Brake lever synchronization
- Aluminium shoes with non asbestos organic linings
- Self lubricated bushings at main hinge points
- All exposed steel parts are with Zinc Al Flake coating on demand

Operating conditions

- Ambient temperature: -20°C to 70°C
- Relative humidity no higher than 90%
- IP rating: IP65



Options:

AV - DV	Thruster delay: Ascent Valve or Descent Valve
BELS	Brake Engaging Limit Switch
BRLS	Brake Release Limit Switch
HRL	Hand release lever with or without stop
HRLM	Switch for hand release monitoring
LWI	Full lining wear indicators
SPA	Paint according to Customer Specification
SV	Special Voltage

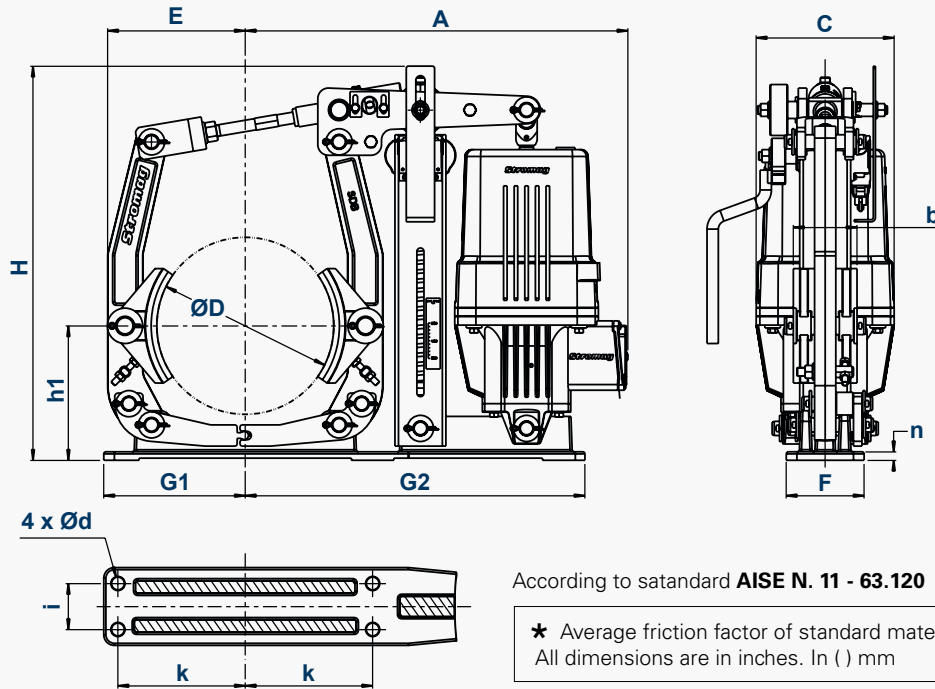
Thruster Technical Data:

Thruster type	Power (W)	Current at 400 V (A)	Weight (kg)
PT 230/5	200	0.5	14
PT 300/5	200	0.5	14
PT 500/6	210	0.5	23
PT 800/6	330	1.2	24
PT 1210/6	330	1.2	39
PT 2010/6	450	1.3	39
PT 3010/6	550	1.4	40

DRUM BRAKE - SAB BRAKES

Revision number: T10110-02-I

Revision date: 27.03.2025



Brake type	Thruster PT	M _{BR MAX} (lb-ft) ★	A	b	C	D	d	E	F	H	h1	i	k	n	Weight (lb)
SAB – 6"	230/5	55-110	22.4	1.65	6.3	6 (152)	3/8 (9.5)	5.5	7.25	16.5	4.75 (120)	3 (76)	4 (102)	0.38	70
SAB – 8"	230/5	85-190	25.16	3.00	6.3	8 (203)	0.69 (17)	6.73	7.28	19.29	7.0 (178)	5.76 (146)	3.25 (83)	0.39	77
	300/5	140-275													84
SAB – 10"	230/5	110-220	28.46	3.54	6.3	10 (254)	0.69 (17)	8.07	7.87	21.65	8.38 (213)	6.26 (160)	4.0 (102)	0.47	100
	300/5	140-280			106										
	500/6	220-440	29.92		7.48	116									
SAB – 12"	300/5	170-345	32.44	5.51	6.3	12 (305)	0.81 (21)	10.40	11.00	23.86	9.88 (251)	9.0 (228)	5.75 (146)	0.55	155
	500/6	270-540	7.48		164										
	800/6	430-855	33.6		176										
SAB – 13"	300/5	180-375	32.44	5.51	6.3	13 (330)	0.81 (21)	10.40	11.00	23.86	9.88 (251)	9.0 (228)	5.75 (146)	0.55	160
	500/6	295-590	7.48		164										
	800/6	460-930	33.6		176										
SAB – 15"	500/6	330-665	40.20	6.49	7.48	15 (381)	1.06 (27)	12.20	13.38	28.15	12.13 (308)	10.76 (273)	7.5 (191)	0.55	300
	800/6	515-1030			30.51					308					
	1210/6	840-1675	39.76		9.45	335									
SAB – 16"	500/6	355-710	40.20	6.49	7.48	16 (406)	1.06 (27)	12.20	13.38	28.15	12.13 (308)	10.76 (273)	7.5 (191)	0.55	304
	800/6	550-1110			30.51					308					
	1210/6	900-1800	39.76		9.45	335									
SAB – 19"	800/6	665-1330	46.46	8.50	7.48	19 (483)	1.06 (27)	14.64	15.35	30.27	13.25 (337)	13 (330)	9.25 (235)	0.79	445
	1210/6	1055-2110			32.95					455					
	2010/6	1700-3390			9.45	455									
SAB – 23"	1210/6	1220-2440	53.15	10.98	9.45	23 (584)	1.31 (33)	17.60	18.90	41.0	15.88 (403)	16 (406)	11.75 (298)	0.79	695
	2010/6	1900-3870													695
	3010/6	2850-5760													705
	3010/12	3450-6900													
SAB – 30"	1210/6	1400-2800	70.00	14.01	9.45	30 (762)	1.56 (40)	21.57	22.83	53.34	20.75 (527)	19 (482)	15.0 (381)	1.06	950
	2010/6	2360-4720													950
	3010/6	3650-7370													980
	3010/12	4400-8800													

Service Brakes

DRUM BRAKE - FNS-PT BRAKES

Revision number: T03109-01-F

Revision date: 02.04.2025

Standard DIN 15435

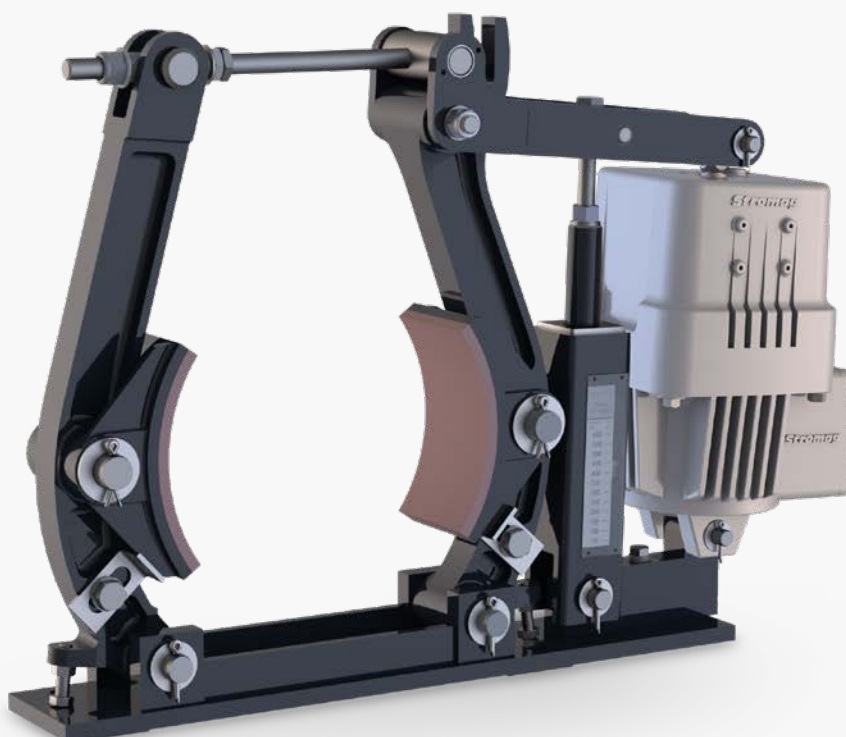
Spring application

Thruster release

Protection level: C3M

Voltage: 230 / 400V 50 Hz

Other voltages, consult us.



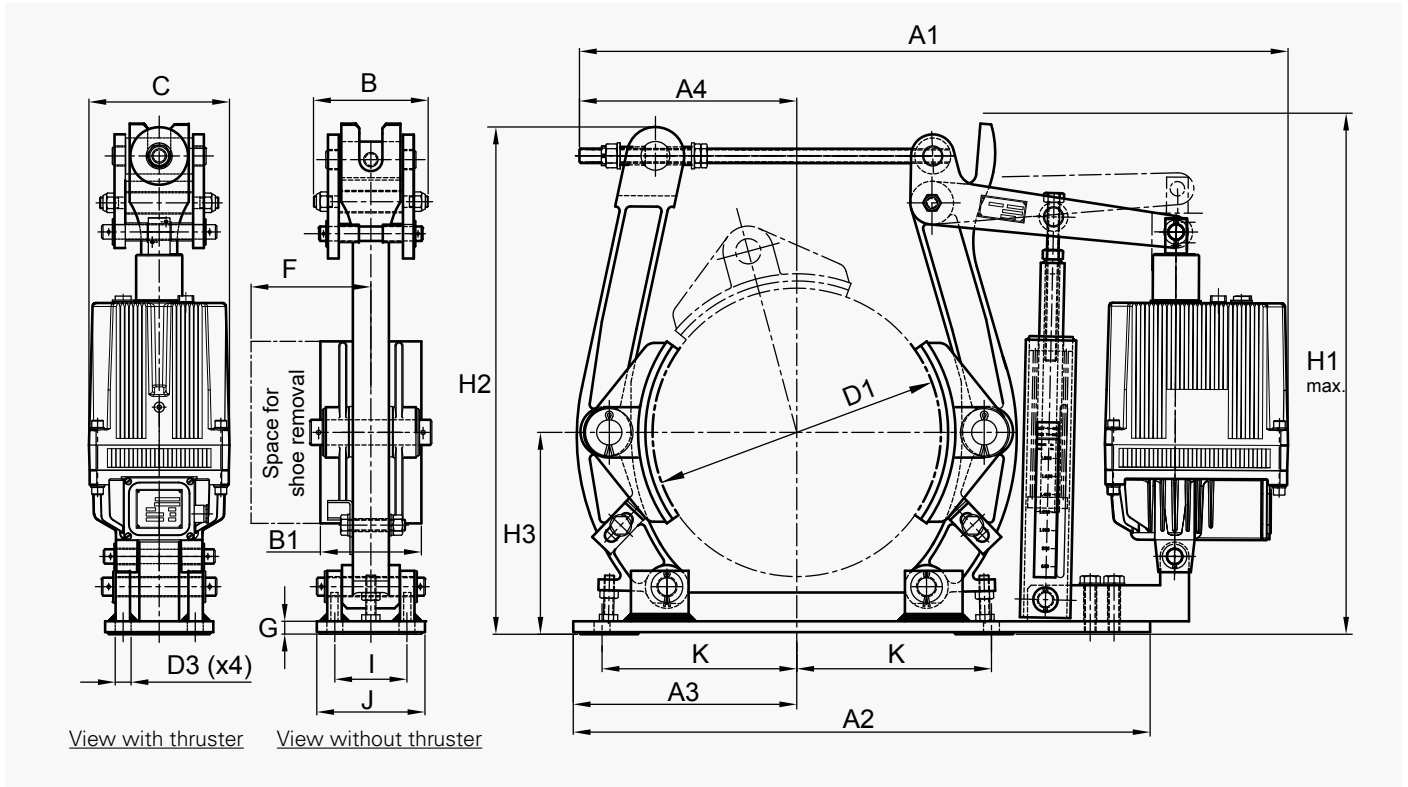
Options

AT	High temperature
BT	Low temperature
ATEX	Certificat ATEX / Thruster
BI	Stainless steel bolts
CSA	Opening proving switch
DD	Lining wear indicators
DM	Hand release lever
LM	Locking lever to hold the brake open
PE	Special paint: color / > C3M
PL	Padlock for the locking lever
PR	Reduced torque
RA	Automatic lining wear compensation
VD	Descent valve
	Brake not fitted with the thruster

DRUM BRAKE - FNS-PT BRAKES

Revision number: T03109-01-F

Revision date: 02.04.2025



BRAKE TYPE	Thruster	TORQUE N.m.		WEIGHT kg	DRUM WIDTH	SHOE WIDTH	DIMENSIONS																
		min.	max.				D1	D3	H3	I	K	A1	A2	A3	A4	B	C	F	G	H1	H2	J	
160	I-256	118	235	28	60	65	160	11	130	55	120	614	420	140	177	116	160	110	20	424	364	90	
200	I-256	125	250	29	75	70	200	14	160	55	145	664	510	185	178	116	160	125	19	405	355	90	
	I-356	188	375	34								674								497			
250	I-256	128	255	35	95	90	250	18	190	65	180	710	580	220	210	116	160	130	13	425	413	100	
	I-356	235	470	40								760								499			
315	I-356	275	550	59	118	110	315	18	230	80	220	769	690	260	223	159	160	180	18	595	588	120	
	II-506	438	875	62								820					195			620			
	II-806	700	1400	63								820					195			635			
400	II-506	450	900	85	150	140	400	22	280	100	270	980	800	310	307	159	195	210	18	710	704	150	
	II-806	760	1520	87								990				159	195			710			
	III-1306	1350	2700	107								975				164	240			775			
500	II-806	800	1600	125	190	180	500	22	340	130	325	1039	940	365	312	190	195	250	23	820	803	180	
	III-1306	1325	2650	145								1060					240						
	III-2006	2125	4250	147								1060					240						
630	III-1306	1450	2900	240	236	225	630	27	420	170	400	1240	1150	460	435	230	240	305	23	955	940	220	
	III-2006	2325	4650	242								1240											
	III-3006	3725	7450	244								1240											
	III-3012	3875	7750	258								1325											
710	III-2006	2875	5750	323	265	255	710	27	470	190	450	1405	1405	1280	510	470	250	240	340	29	1085	1067	250
	III-3006	4300	8600	324																			
	III-3012	4950	9900	338																			

For higher torque, please consult us. Some types may present little differences in the form with the drawing

DRUM BRAKE - FNS-T BRAKES

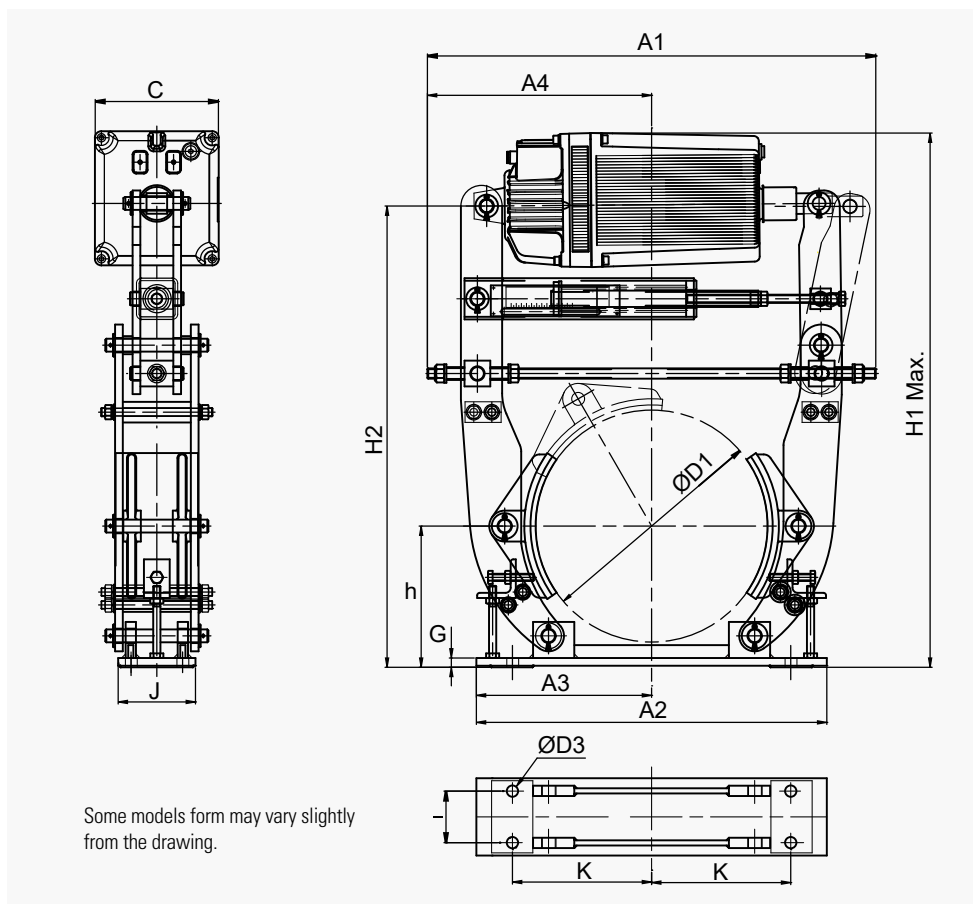
Revision number: T10101-01-B

Revision date: 22.08.2022

Standard DIN 15435

Spring application

Thrustor release



BRAKE TYPE	THRUSTOR TYPE	TORQUE Nm		WEIGHT Kg	PULLEY WIDTH	SHOE WIDTH	DIMENSIONS													
		min.	max.				D1	D3	H	I	K	A1	A2	A3	A4	C	G	H1	H2	J
160	I-256	60	150	30	80	65	160	11	125	55	108	445	275	137.5	218	160	10	548	428	80
200	I-256	90	230	30	75	70	200	14	160	55	145	487	370	185	250	160	19	638	518	90
	I-356	110	330	36								548			272					
250	I-256	90	290	37	95	90	250	18	190	65	180	545	440	220	277	160	13	756	638	100
	I-356	90	410	42												160				
315	I-356	230	570	62	118	110	315	18	230	80	220	675	520	260	348	160	18	890	770	120
	II-506	310	780	65												195		926.5		
	II-806	500	1300	66												195		926.5		
400	II-506	350	870	89	150	140	400	22	280	100	270	870	620	310	443	195	18	1062.5	906	150
	II-806	580	1450	91												195		1062.5		
	III-1306	950	2450	112												240		1040		
	II-506	450	1150	131												195		1180		
500	II-806	700	1750	152	190	180	500	22	340	130	325	850	730	365	445	195	23	1180	1050	180
	III-1306	1200	3000	154												240		1190		
	III-2006	1800	4700	252												2340		1190		
	III-2006	1800	4700	252												2340		1190		

DRUM BRAKE - FEM-A BRAKES

Revision number: T3309-01-A

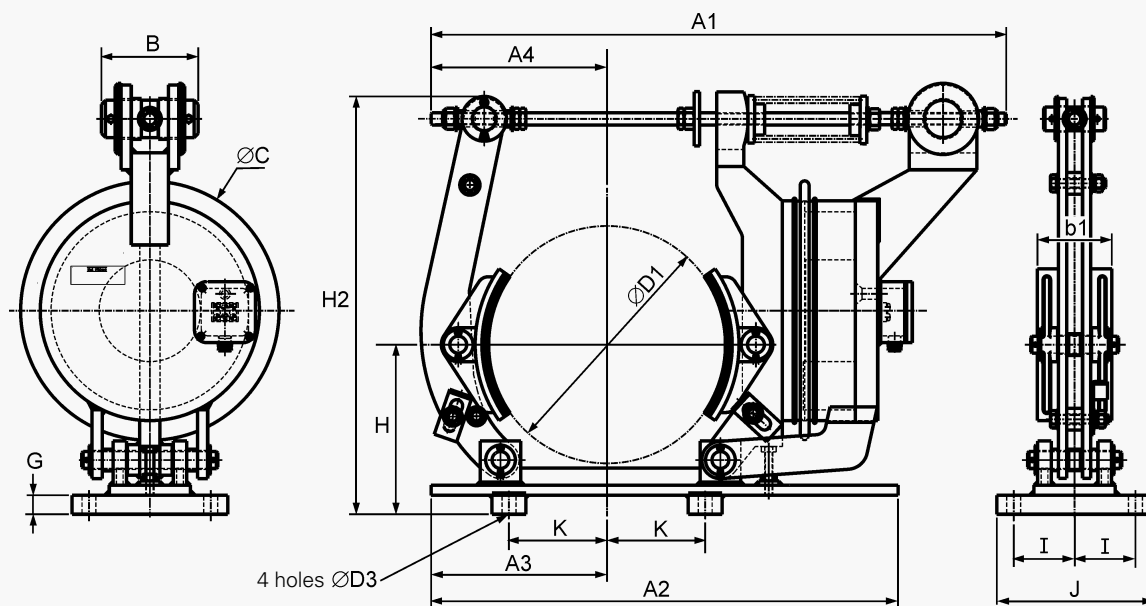
Revision date: 06.07.2007

Standard SIME™

Spring application
Electromagnetic release
Association with AFM and DFM power supplies

Options:

Automatic lining wear compensation **R**
Switch for opening monitoring
Lining wear indicators
Hand release **DM**



TYPES	TORQUE * Nm	POWER W	WEIGHT kg	SHOE WIDTH	DIMENSIONS													
				b1	A1	A2	A3	A4	B	C	D1	D3	G	H	H2	I	J	K
200	210	150	50	70	565	510	185	173	111	260	200	15	8	160	368	65	160	75
250	405	200	70	90	665	580	220	202	122	303	250	20,5	8	180	416	65	160	94
350	675	325	135	110	850	690	260	260	145	382	350	20,5	28	250	616	90	230	145
450	1575	420	230	160	1000	800	310	325	155	402	450	23	29	300	724	110	270	190
530	2650	530	255	180	1080	940	365	360	155	464	530	25	23	355	817	120	290	235
600	4660	580	365	190	1160	1150	460	390	180	505	600	28	22	400	955	127	310	272
750	10350	710	705	210	1500	1280	510	526	185	554	750	31	34	475	1064	145	350	338

* Torque intermittent and continuous duties

DRUM BRAKE - FED-A 150 BRAKE

Revision number: T03409-01-I

Revision date: 18.04.2023

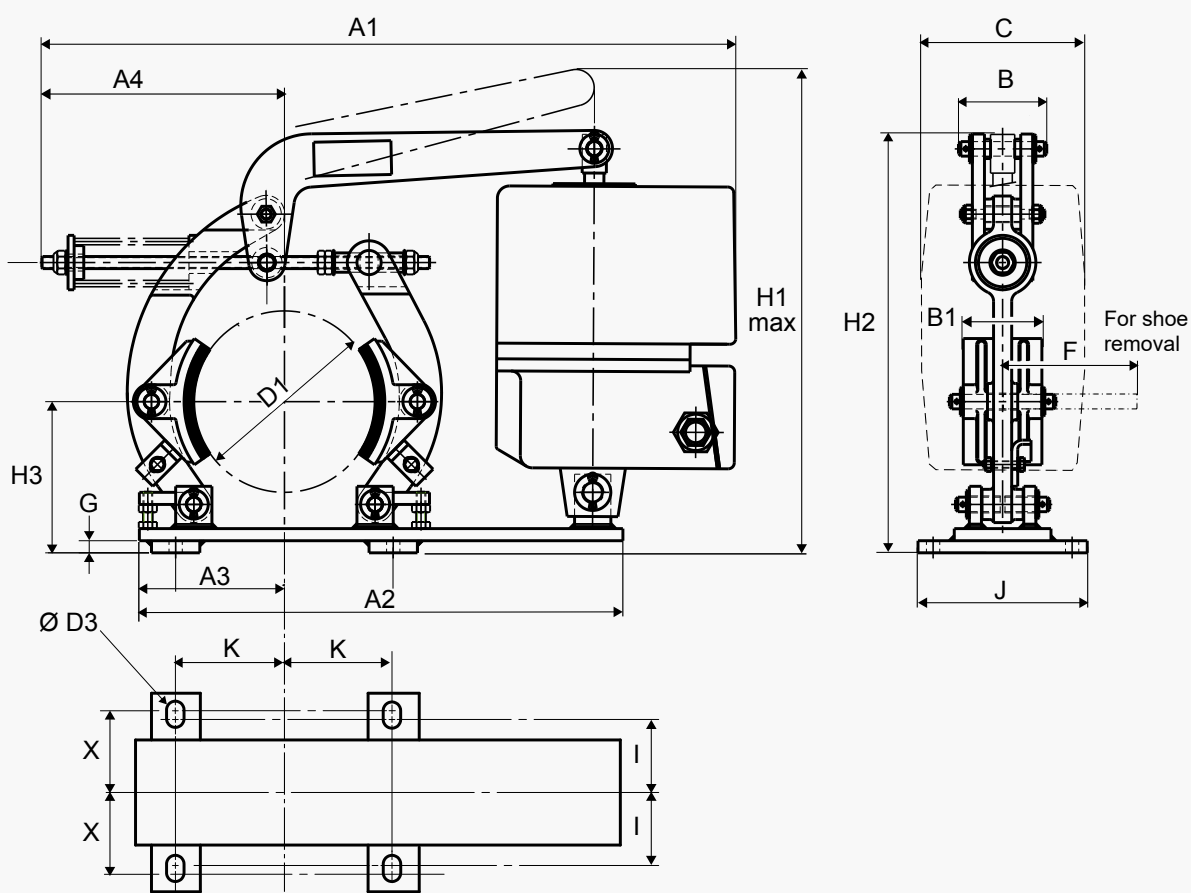
Standard SIME™

Spring application
Thruster release
Protection level : C3M
Voltage : 230 / 400V 50 Hz
Other voltages, consult us.

Options:

AT High temperature
BT Low temperature
ATEX Certificat ATEX / Thruster
BI Stainless steel bolts
CSA Opening proving switch
DD Lining wear indicators
DM Hand release lever

LM Locking lever to hold the brake open
PE Special paint : color / > C3M
PL Padlock for the locking lever
PR Reduced torque
RA Automatic lining wear compensation
VD Descent valve
Brake not fitted with the thruster



Some types may present little differences in the form with the drawing.

BRAKE TYPE	Thruster VS	TORQUE N.m.		WEIGHT kg	WIDTH		DIMENSIONS																
		DRUM	SHOE																				
			min.		max.	B1	D1	D3	H3	A1	A2	A3	A4	B	C	F	G	H1	H2	I	J	K	X
150	I-256	65	130	24	80	65	150	11	125	577	400	120	201	73	160	70	10	411	351	57,5	160	90	67,5

DRUM BRAKE - FED-A 200 & 250 BRAKES

Revision number: T03409-01-I

Revision date: 18.04.2023

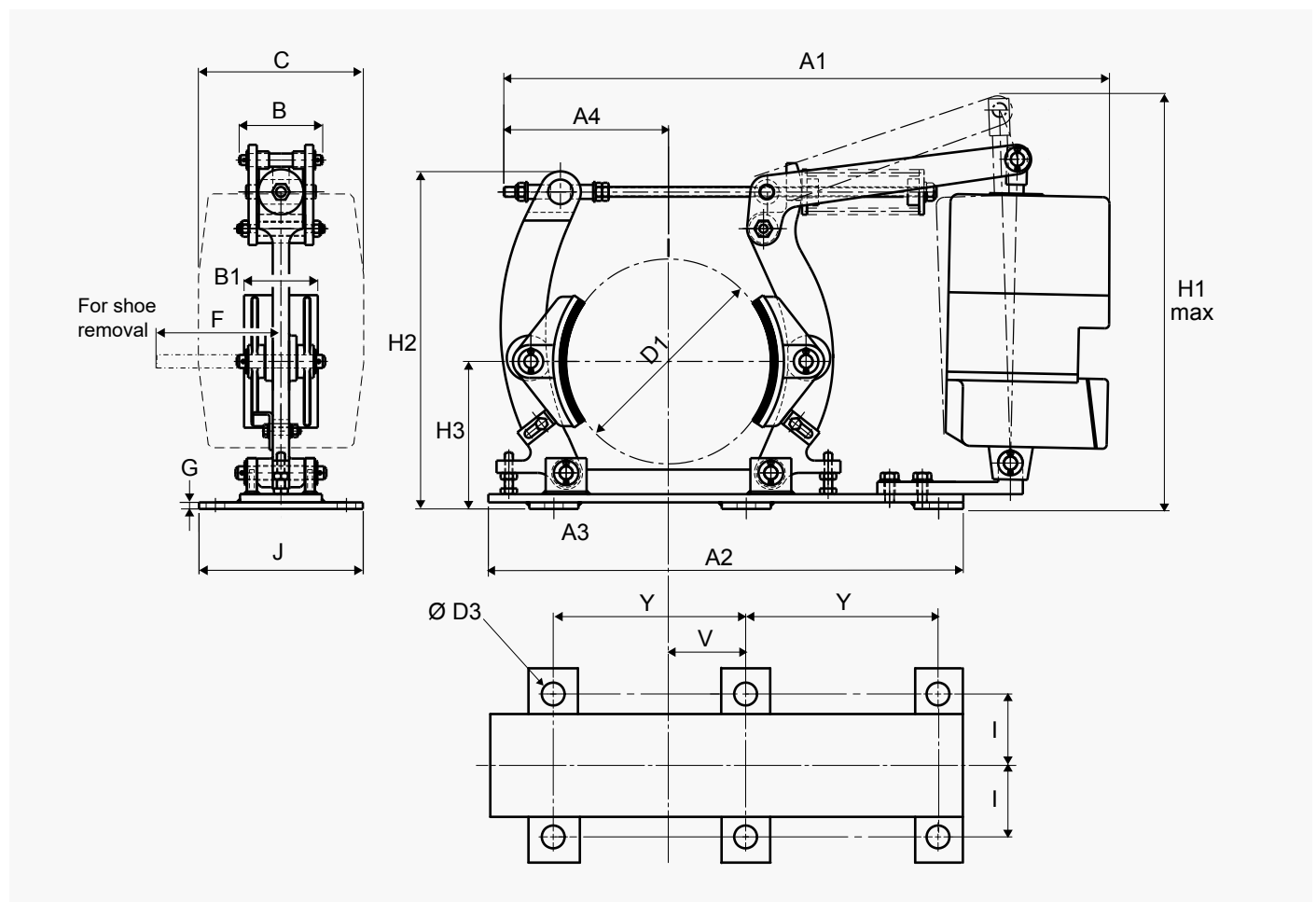
Standard SIME™

Spring application
Thrust release
Protection level : C3M
Voltage : 230 / 400V 50 Hz
Other voltages, consult us.

Options:

AT High temperature
BT Low temperature
ATEX Certificat ATEX / Thruster
BI Stainless steel bolts
CSA Opening proving switch
DD Lining wear indicators
DM Hand release lever

LM Locking lever to hold the brake open
PE Special paint : color / > C3M
PL Padlock for the locking lever
PR Reduced torque
RA Automatic lining wear compensation
VD Descent valve
Brake not fitted with the thruster



Some types may present little differences in the form with the drawing.

BRAKE TYPE	Thruster VS	TORQUE N.m.		WEIGHT kg	WIDTH		DIMENSIONS																
					DRUM	SHOE																	
							min.	max.	B1	D1	D3	H3	A1	A2	A3	A4	B	C	F	G	H1	H2	I
200	I-256	135	270	30	80	70	200	16	160	675	510	185	197	116	160	125	9	404	355	65	160	61	175
	I-356	175	350	35																			
250	I-256	165	330	36	90	90	250	18	180	690	580	220	201	107	160	130	9	423	413	80	200	95	235
	I-356	250	500	41																			

DRUM BRAKE - FED-A 350 & 450 BRAKES

Revision number: T03409-01-I

Revision date: 18.04.2023

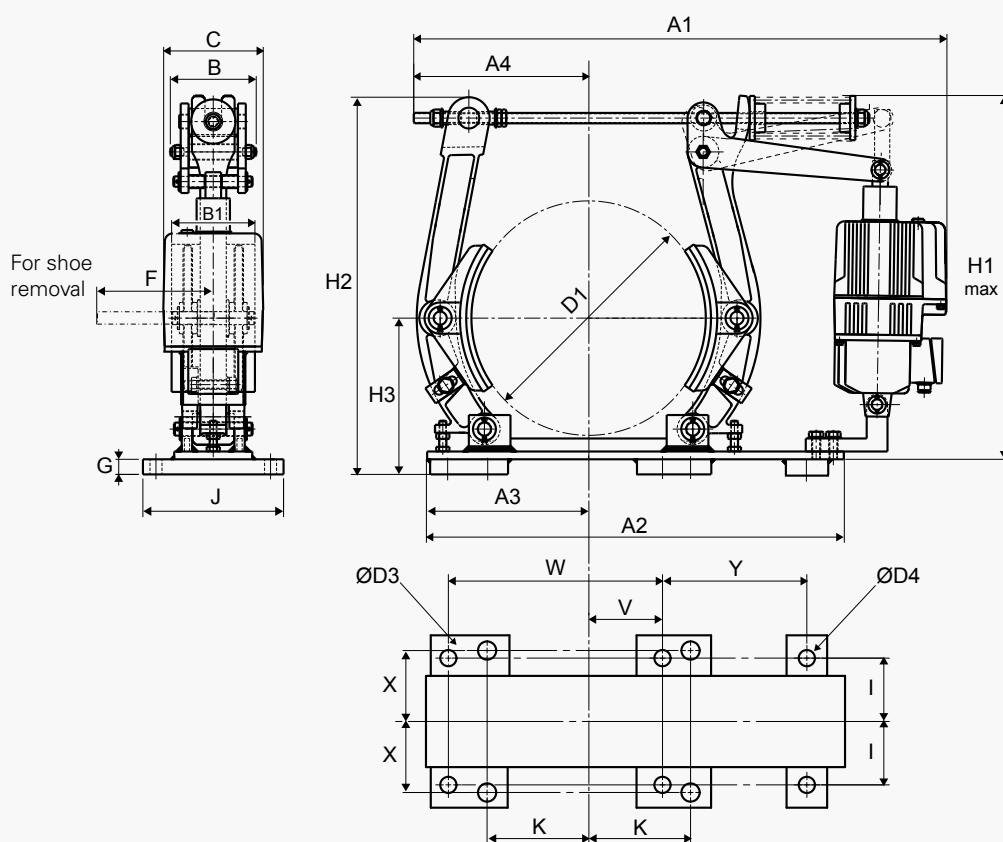
Standard SIME™

Spring application
Thruster release
Protection level : C3M
Voltage : 230 / 400V 50 Hz
Other voltages, consult us.

Options:

AT High temperature
BT Low temperature
ATEX Certificat ATEX / Thruster
BI Stainless steel bolts
CSA Opening proving switch
DD Lining wear indicators
DM Hand release lever

LM Locking lever to hold the brake open
PE Special paint : color / > C3M
PL Padlock for the locking lever
PR Reduced torque
RA Automatic lining wear compensation
VD Descent valve
Brake not fitted with the thruster



Some types may present little differences in the form with the drawing.

BRAKE TYPE	Thruster VS	TORQUE N.m.		WEIGHT kg	WIDTH		DIMENSIONS																				
		DRUM	SHOE		D1	D3	D4	H3	A1	A2	A3	A4	B	C	F	G	H1	H2	I	J	K	V	W	X	Y		
																										B1	
350	I-356	325	650	61	130	110	350	20,5	20	250	855	690	260	263	160	160	180	28	615	613	105	230	145	105	335	90	335
	II-506	500	1000	64							920			278		195			644								
	II-806	800	1600	65							960			291		195			659								
450	II-506	625	1250	88	170	160	450	23	23	300	1045	800	310	326	165	195	190	29	728	724	107,5	270	190	238	603	110	302
	II-806	850	1700	90							1055			336		195			728								
	III-1306	1375	2750	110							1080			360		240			803								

DRUM BRAKE - FED-A 530 & 750 BRAKES

Revision number: T03409-01-I

Revision date: 18.04.2023

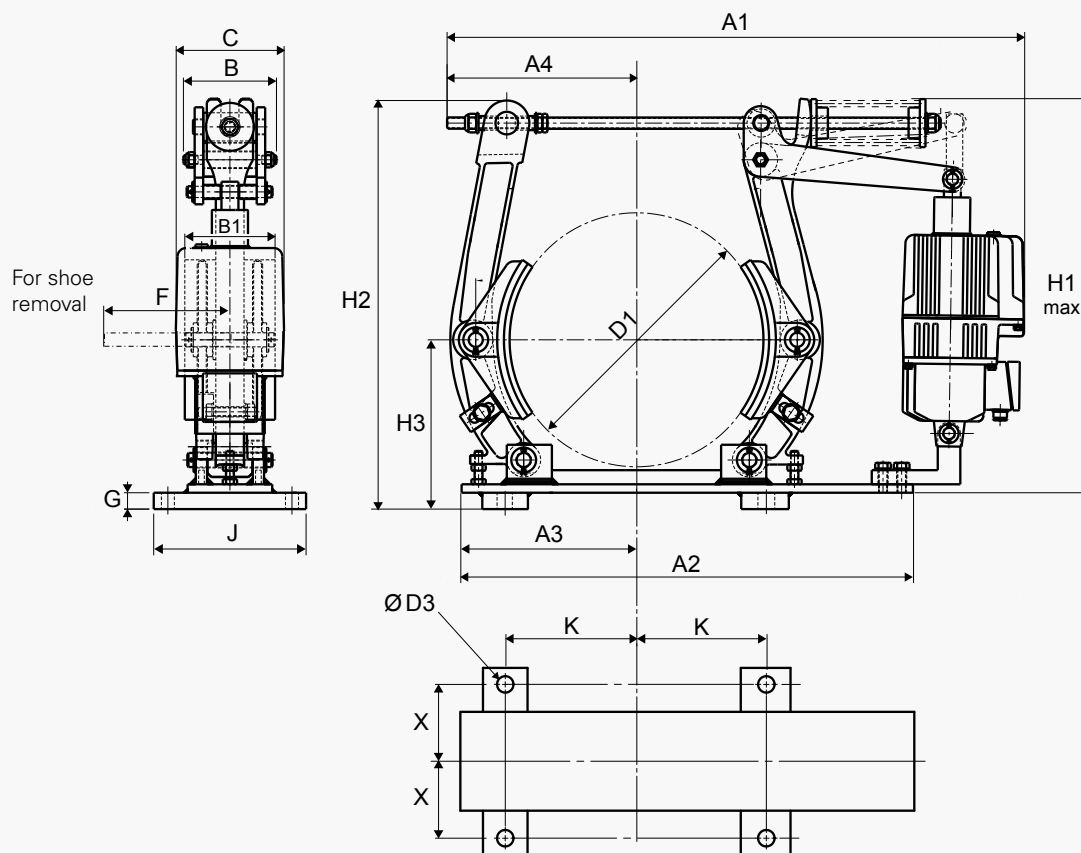
Standard SIME™

Spring application
Thrust release
Protection level : C3M
Voltage : 230 / 400V 50 Hz
Other voltages, consult us.

Options:

AT High temperature
BT Low temperature
ATEX Certificat ATEX / Thruster
BI Stainless steel bolts
CSA Opening proving switch
DD Lining wear indicators
DM Hand release lever

LM Locking lever to hold the brake open
PE Special paint : color / > C3M
PL Padlock for the locking lever
PR Reduced torque
RA Automatic lining wear compensation
VD Descent valve
Brake not fitted with the thruster



Some types may present little differences in the form with the drawing.

BRAKE TYPE	Thruster VS	TORQUE N.m.		WEIGHT kg	WIDTH		DIMENSIONS															
		DRUM	SHOE																			
			min.		max.	B1	D1	D3	H3	A1	A2	A3	A4	B	C	F	G	H1	H2	J	K	X
530	II-806	925	1850	131	195	180	530	25	355	1145	940	365	383	190	195	240	23	833	823	290	235	120
	III-1306	1475	2950	151						1145			396		240			833				
	III-2006	2325	4650	153						1150			381		240			838				
600	III-1306	1575	3150	242	210	190	600	28	400	1175	1150	460	394	230	240	290	22	947	929	310	272	127
	III-2006	2450	4900	244						1207			424					947				
	III-3006	3275	6550	246						1207			424					949				
	III-3012	4400	8800	260						1330			424					957				
750	III-2006	3025	6050	328	230	210	750	31	475	1375	1280	510	470	250	240	330	34	1084	1071	350	338	145
	III-3006	4000	8000	329						1375			470					1084				
	III-3012	5475	10950	343						1545			504					1084				

HYDRAULIC SERVICE BRAKES

APPLICATIONS

- | | |
|---|---|
| <ul style="list-style-type: none">• PORT CRANES• ALL HOISTING APPLICATIONS• TRAVELLING CONTROL• MASS TRANSPORT | <ul style="list-style-type: none">• STEEL CRANES:
CHARGING AND LADDLE CRANES• SLAG AND SCRAP CRANES• BELT CONVEYORS - MINES |
|---|---|



MAIN CHARACTERISTICS	OPTIONS
- FAILSAFE BRAKES - BRAKING BY HYDROSPRING® SYSTEM - INTEGRAL ELECTRICAL CONNECTIONS - INTEGRAL HYDRAULICAL CONNECTIONS - AUTOMATIC WEAR COMPENSATION	- ADJUSTABLE DELAY OF BRAKE CLOSING - MARINE PROTECTION



2TB - 3TB - 4TB

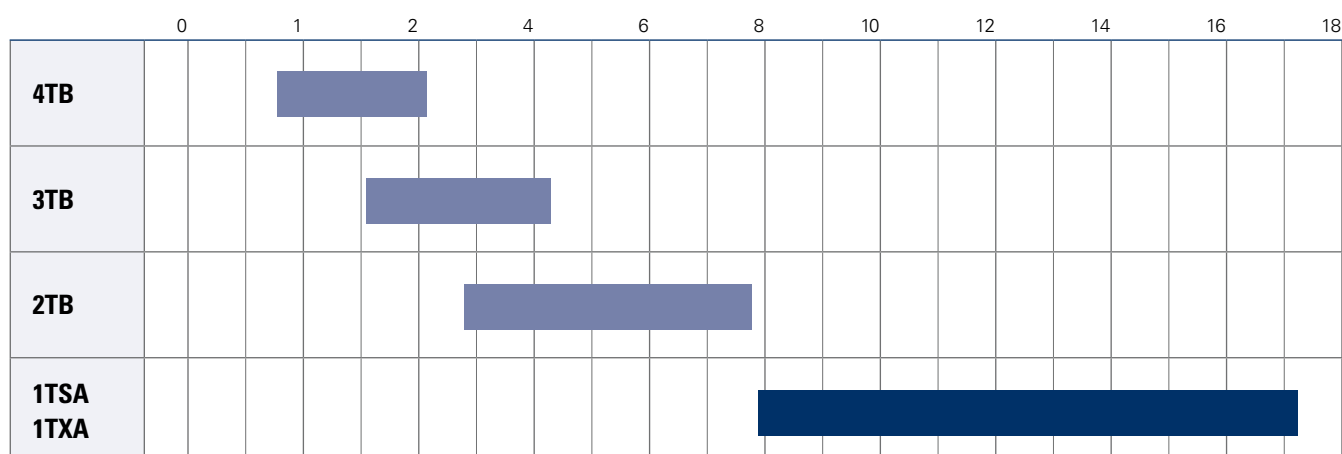
- Association with discs Ø445 to 995
- Options:
 - Torque setting
 - Controlled braking torque /stepped braking torque
 - Protective cover



1TSA - 1TXA

- Association with discs Ø625 to 995
- Torque setting

Braking torque (kN.m)



Service Brakes

DISC BRAKE - 2TB, 3TB AND 4TB CALIPERS

Revision number: T03664-01-C

Revision date: 24.08.2012

Fail safe

Braking by HYDROSPRING® system

Electrico-hydraulically released

Integral hydraulic power unit

Self contained electrical system

Lining wear compensation

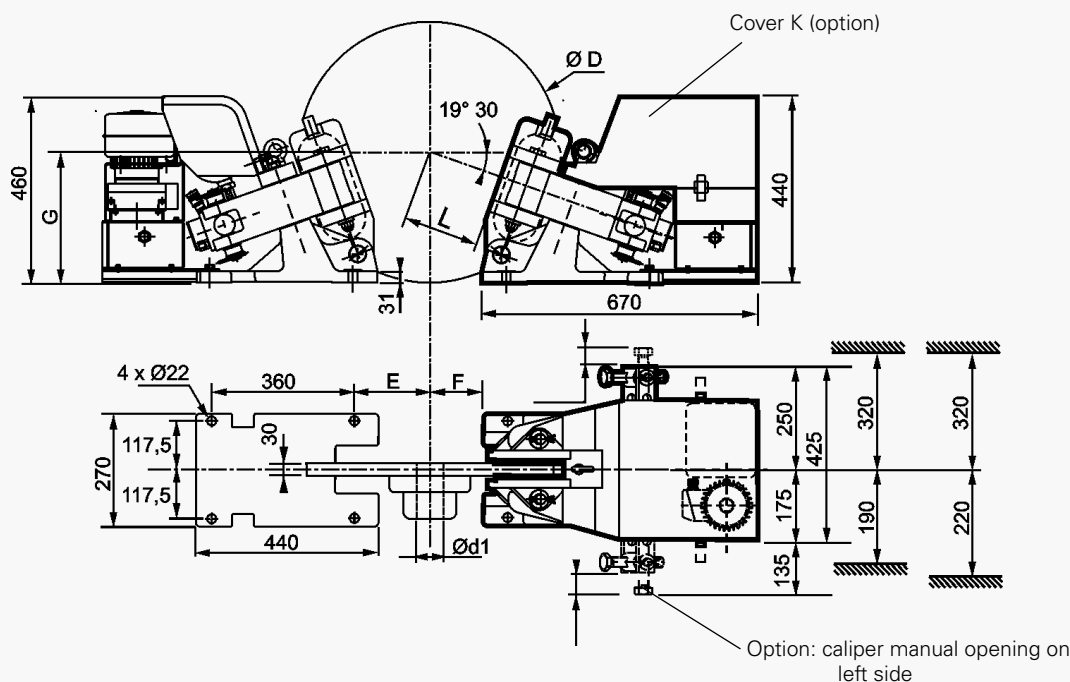
Opening proving switch

Operating conditions:

- Ambient temperature: -10°C to +50°C
 - Relative humidity $\leq 70\%$
 - Dust in atmosphere $\geq 65\mu$
- Other conditions, consult us.

Options:

- Torque setting
- Detection of full lining wear
- Adjustable delay brake closing system from 0.25 to 20secs
- Controlled braking torque ******
- Marine protection
- Protective cover K
- Stepped braking torque ******
- Redundant circuit with 2 solenoid valves



Weight:160 kg

Response time at nominal torque $\leq 0.25\text{s}$

Permissible inclination of the caliper $\pm 45^\circ$ maximum

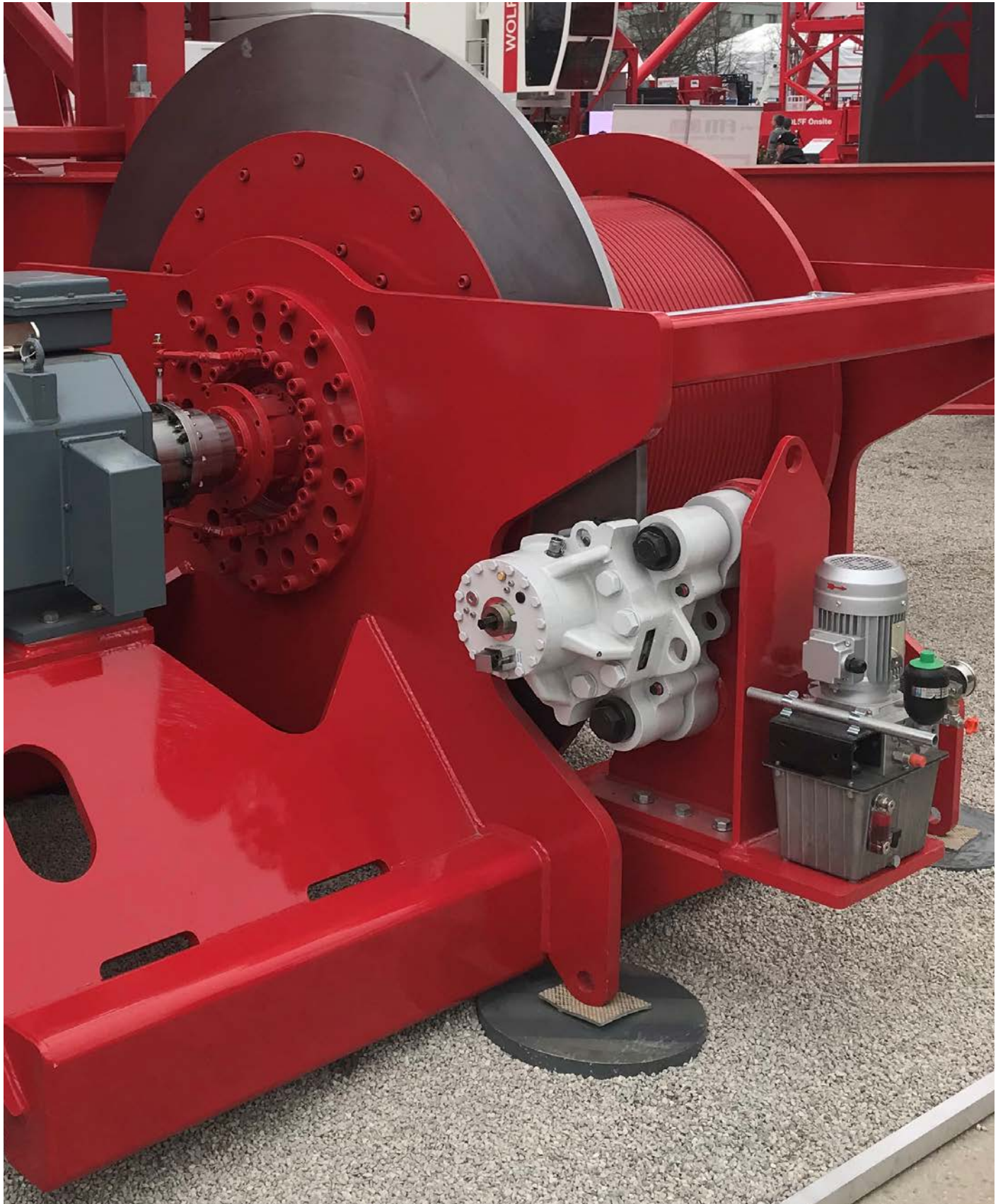
Other mountings: consult us.

Discs			445	495	550	625	705	795	995
Nominal torque for 1 caliper:	2TB 3TB 4TB	N.m N.m N.m	2800 1550 775	3250 1800 900	3700 2050 1030	4400 2450 1230	5100 2850 1430	5900 3250 1630	7800 4300 2150
Maximum disc speed for nominal torque *		rpm	2100	1900	1800	1500	1300	1200	900
D		mm	445	495	550	625	705	795	995
E		mm	100	120	150	185	225	265	365
F		mm	40	60	90	125	165	205	305
G		mm	285	295	305	315	330	345	380
L		mm	90	130	145	180	225	265	370
d1 min. keyed for 1 caliper (steel St 70):	2TB 3TB 4TB	mm mm mm	73 60 48	75 62 49	77 63 50	80 66 52	82 67 53	87 71 57	92 76 58
d1 min. keyed for 2 calipers (steel St 70):	2TB 3TB 4TB	mm mm mm	79 65 53	83 68 55	87 71 57	92 75 60	96 79 63	101 82 66	110 91 69
Maximum reaction on shaft ■:		N N N	18000 10000 5000						

Electric data:

- Power unit motor:
3 phases:
230/400 V $\pm 10\%$, 50 Hz,
0.37 kW, 4 poles
for mains:
230/400 V 50 Hz
or 415 V 50 Hz
or 460 V 60 Hz
- Options motor:
400/690 V $\pm 10\%$ 50Hz
255/440 V $\pm 10\%$ 50Hz
290/500 V $\pm 10\%$ 50Hz
280/480 V $\pm 10\%$ 60Hz
330/575 V $\pm 10\%$ 60Hz
- Other voltages, consult us.
- Electrical casing IP55
- Opening switch:
240 V, 3 A, 10 VA AC
250 V, 0.3 A, 10 W DC

EMERGENCY BRAKES



ELECTROMAGNETIC BRAKES		Braking torque (kNm)												
		0	5	10	20	40	60	80	100	150	200	250	300	350
2SA OSA - 00SA														

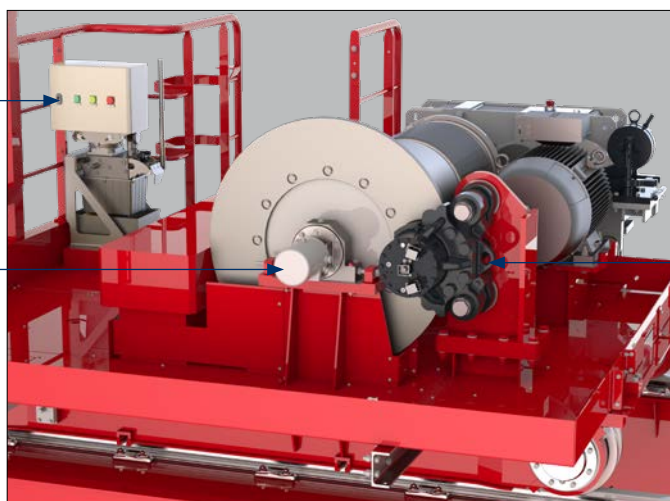
HYDRAULIC BRAKES		Braking torque (kNm)												
		0	5	10	20	40	60	80	100	150	200	250	300	350
SH-SHV disc Ø300 3000														
SHD disc Ø300 2000														
TH - THC disc Ø1000 2000														

Maxi. BT = 458 000 Nm
(SH32 disc Ø 3000 mm)

A COMPLETE BRAKING SOLUTION

Monitoring
and control
system

Limit switch



Brake type
SHD9

ELECTROMAGNETIC EMERGENCY BRAKES

APPLICATIONS

- STEEL INDUSTRY
- NUCLEAR PLANTS



MAIN CHARACTERISTICS	OPTIONS
• FAILSAFE BRAKE BY SPRING APPLICATION • ELECTROMAGNETIC RELEASE • MANUAL LINING WEAR COMPENSATION • OPENING PROVING SWITCH • DETECTION OF FULL LINING WEAR	• LOAD REGULATED LOWERING



OSA

- Option:
Manual release lever
Hydraulic release
Mounting on a vertical axis disc
Flameproof / Marine protection...



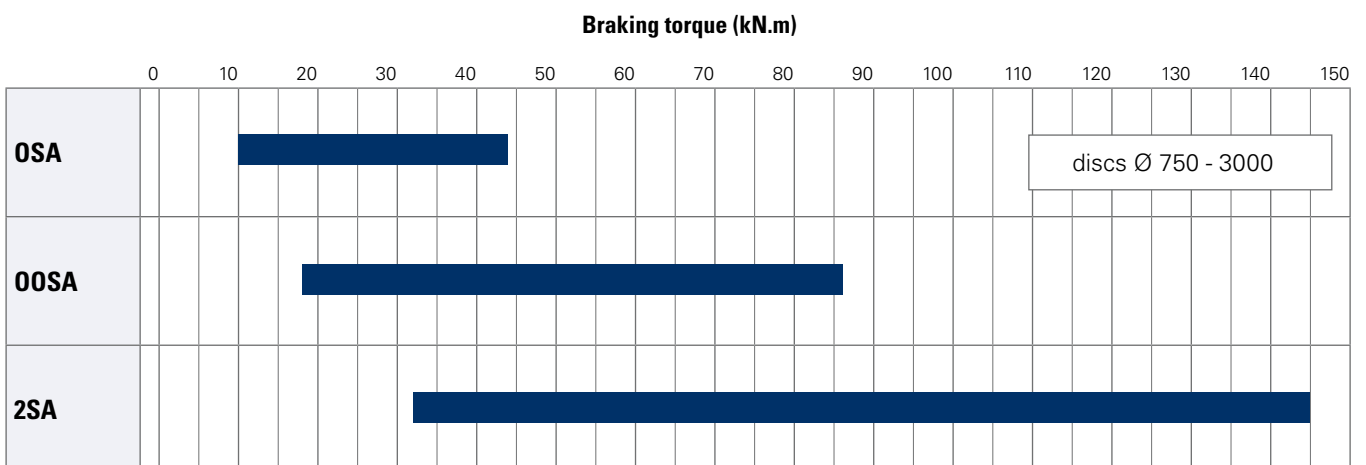
OOSA

- Option:
Manual release lever
Hydraulic release
Flameproof protection
Marine protection



2SA

- Manual wear compensation
Opening proving switch
Air gap switch
- Options :
Load regulated lowering



Emergency Brakes

DISC BRAKE - OSA CALIPER

Revision number: T03750-01-F

Revision date: 22.03.2016

Fail safe braking
Braking by spring application
Electromagnetic release
Manual lining wear compensation
Detection of full lining wear
Opening proving switch

Operating conditions:

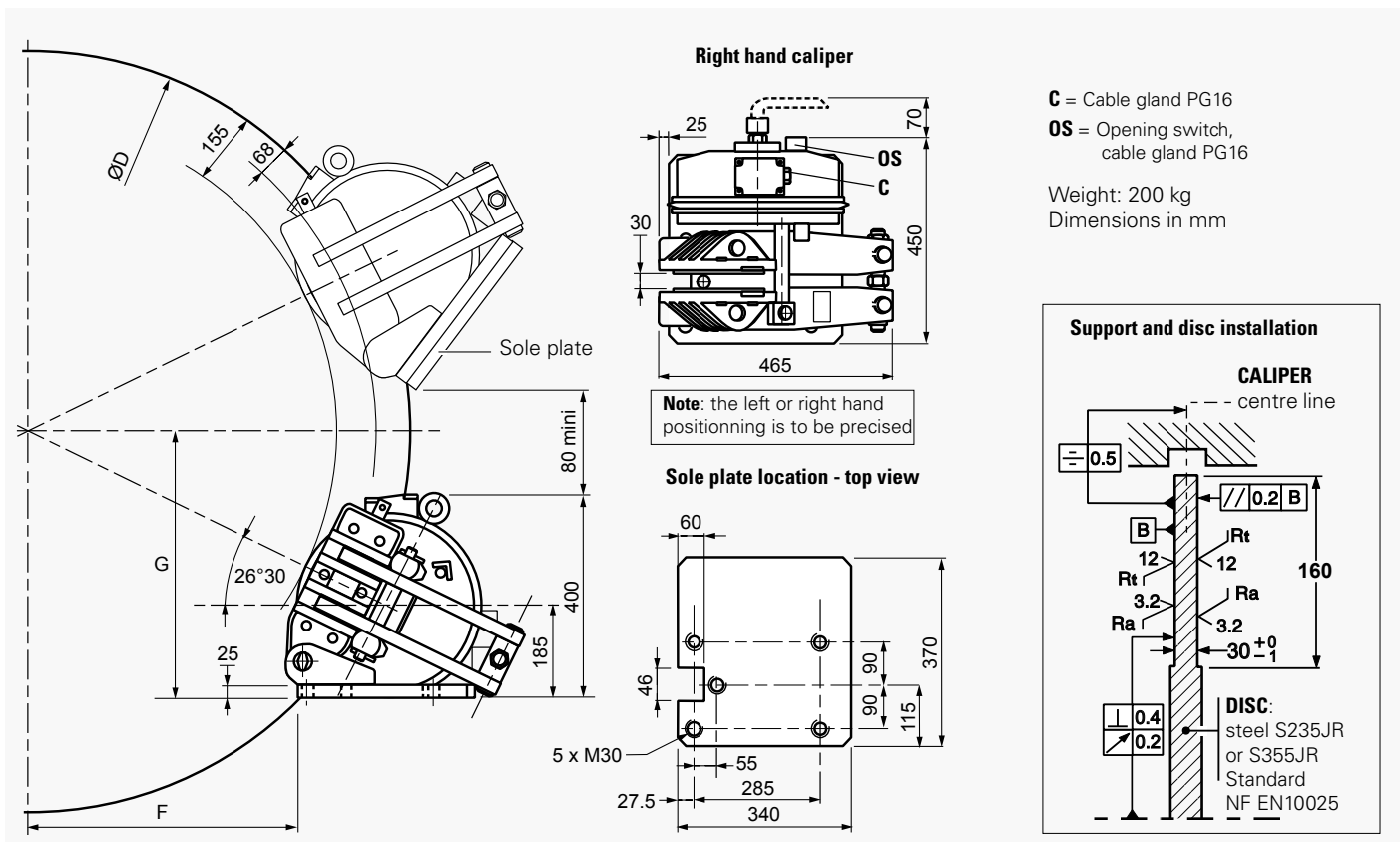
- Ambient temperature: -10°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ
- Other conditions, consult us.

Use:

The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains.

Options:

- Manual release lever
- Hydraulic release
- Load regulated lowering
- Flameproof protection
- Marine protection
- Mounting on a vertical axis disc



Response time at nominal torque:
see the leaflet of the associated electrical power supply.
Force values are subject to a variation of ±10%.

Designation	Caliper		OSA
	Lining *		US2-1
Braking force EF	Static	N	27 900
	Dynamic	N	31 000
Linear speed of the disc		m/s	≤ 10
Dynamic braking torque BT (N.m) for 1 caliper and disc ØD (mm)	1000 mm	N.m	13 400
	1200 mm	N.m	16 500
	1500 mm	N.m	21 100
	2000 mm	N.m	28 900
BT for other ØD (mm)		N.m	BT = BF (D/2000 - 0.068)
F		mm	F = (0.4475 × ØD) - 150
G		mm	G = 196 + (0.2231 × ØD)

Opening proving switch:

250VAC maxi., 5A maxi., with interrupting capacity: 50VA maxi
220VDC maxi., 5A maxi., with interrupting capacity: 50W maxi
Compatible with PLC (Programmable Logic Controllers).
An opening switch used with other equipment than PLC must not be reused with a PLC.

- * **US2-1:** disc temperature during one braking ≤ 150°C
US2-5: disc temperature during one braking ≤ 350°C.
optional. consult us.

DISC BRAKE - OOSA CALIPER

Revision number: T03770-01-E

Revision date: 22.03.2016

Fail safe braking
Braking by spring application
Electromagnetic release
Manual lining wear compensation
Detection of full lining wear
Opening proving switch

Operating conditions:

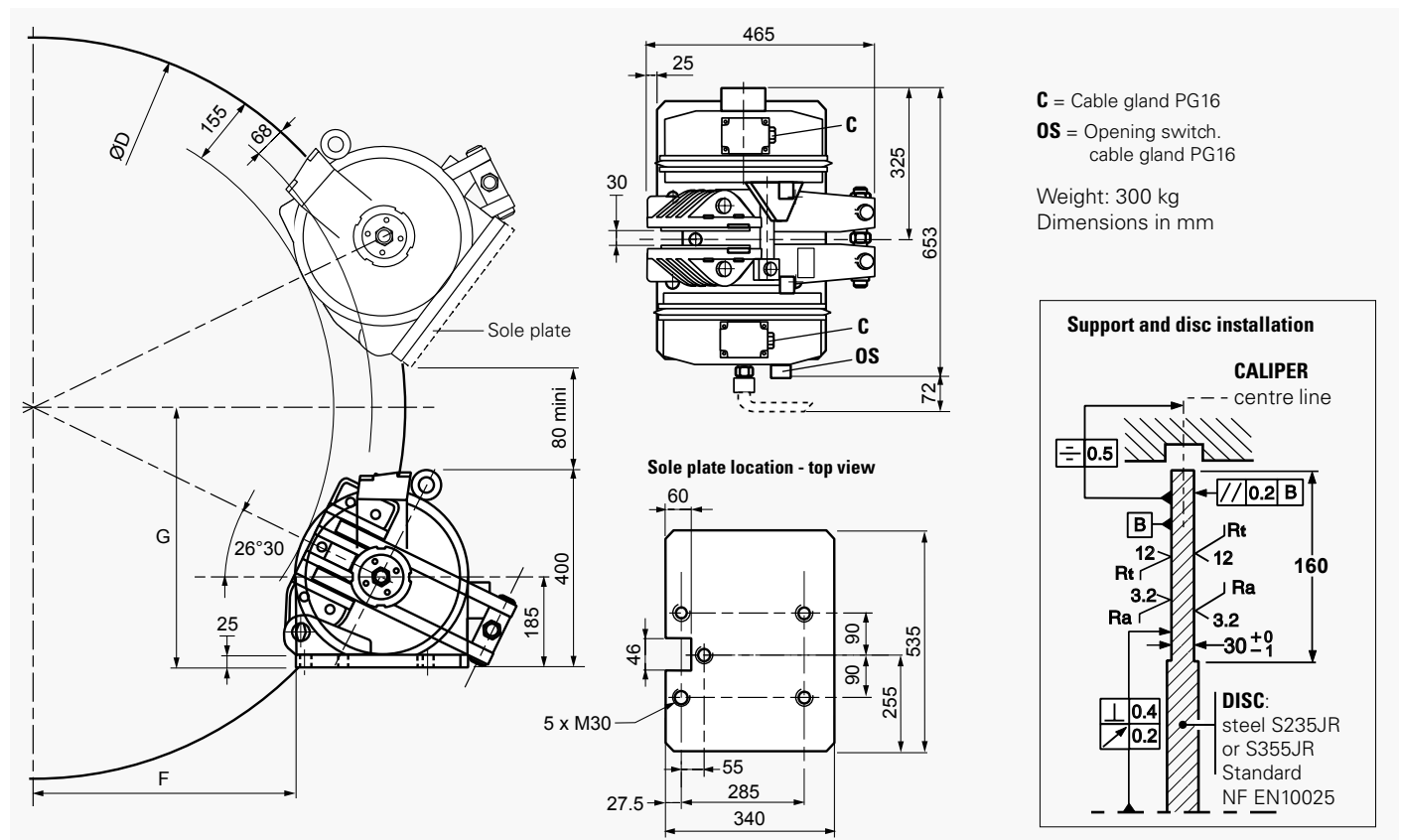
- Ambient temperature: -10°C to +60°C
 - Relative humidity ≤ 70%
 - Dust in atmosphere ≥ 65µ
- Other conditions, consult us.

Use:

The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains.

Options:

- Load regulated lowering
- Flameproof protection
- Marine protection



Response time at nominal torque:
see the leaflet of the associated electrical power supply.
Force values are subject to a variation of ±10%.

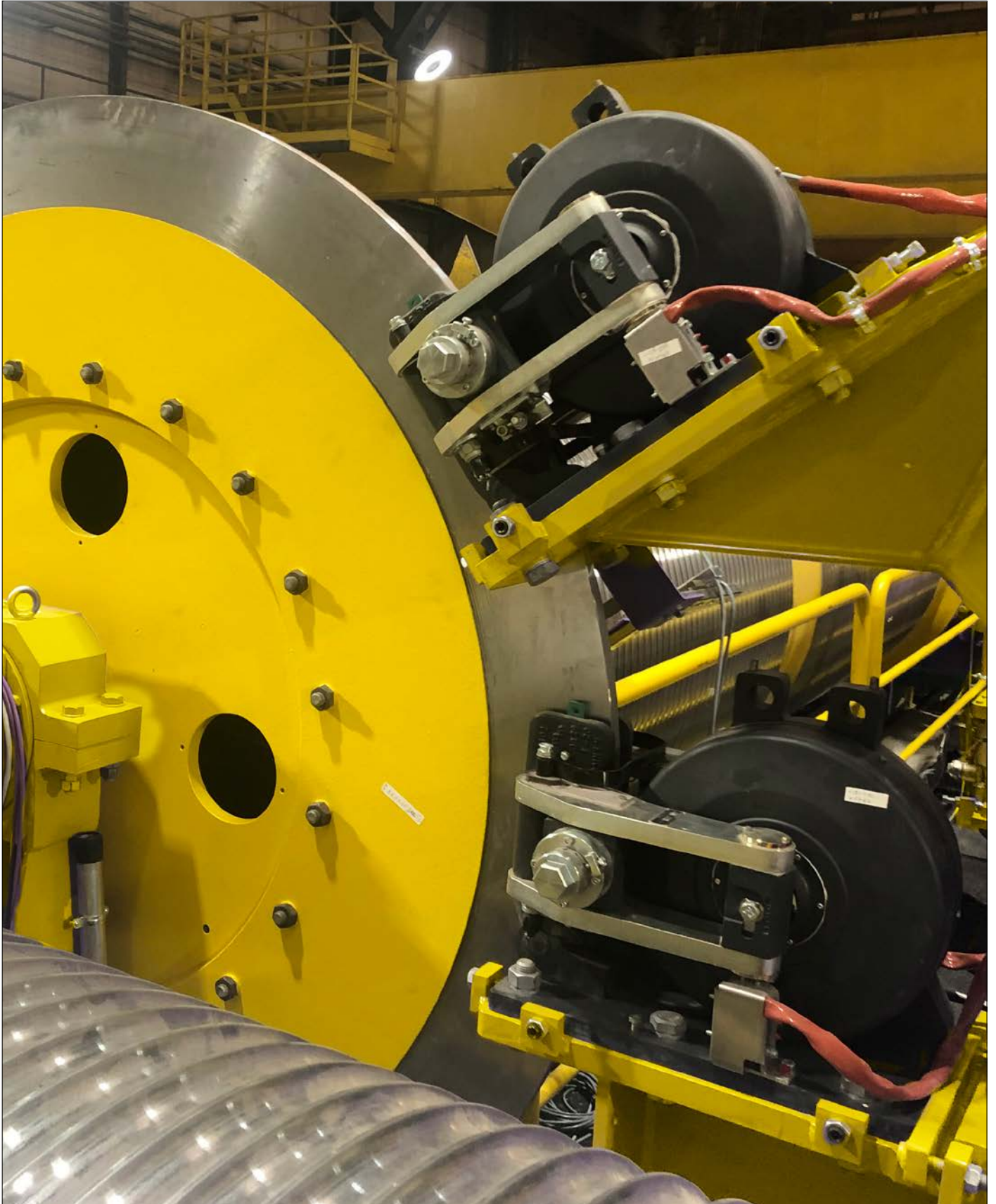
Designation	Caliper		OOSA
	Lining *		US2-1
Braking force BF	Static	N	54 000
	Dynamic	N	60 000
Linear speed of the disc		m/s	≤ 10
Dynamic braking torque BT (N.m) for 1 caliper and 1 disc ØD (mm)	1000 mm	N.m	25 900
	1200 mm	N.m	31 900
	1500 mm	N.m	40 900
	2000 mm	N.m	55 900
BT for other ØD (mm)		N.m	BT = BF (D/2000 - 0.068)
F		mm	F = (0.4475 × ØD) - 150
G		mm	G = 196 + (0.2231 × ØD)

Opening proving switch:

250VAC maxi., 5A maxi., with interrupting capacity: 50VA maxi
220VDC maxi., 5A maxi., with interrupting capacity: 50W maxi
Compatible with PLC (Programmable Logic Controllers).
An opening switch used with other equipment than PLC must
not be reused with a PLC.

- * **US2-1:** disc temperature during one braking ≤ 150°C
US2-5: disc temperature during one braking ≤ 350°C.
optional. consult us.

DISC BRAKE - 2SA CALIPER



DISC BRAKE - 2SA CALIPER

Revision number: T03781-01-D

Revision date: 22.03.2016

Fail safe braking
Braking by spring application
Electromagnetic release
Manual lining wear compensation
Opening proving switch
Air gap switch

Operating conditions:

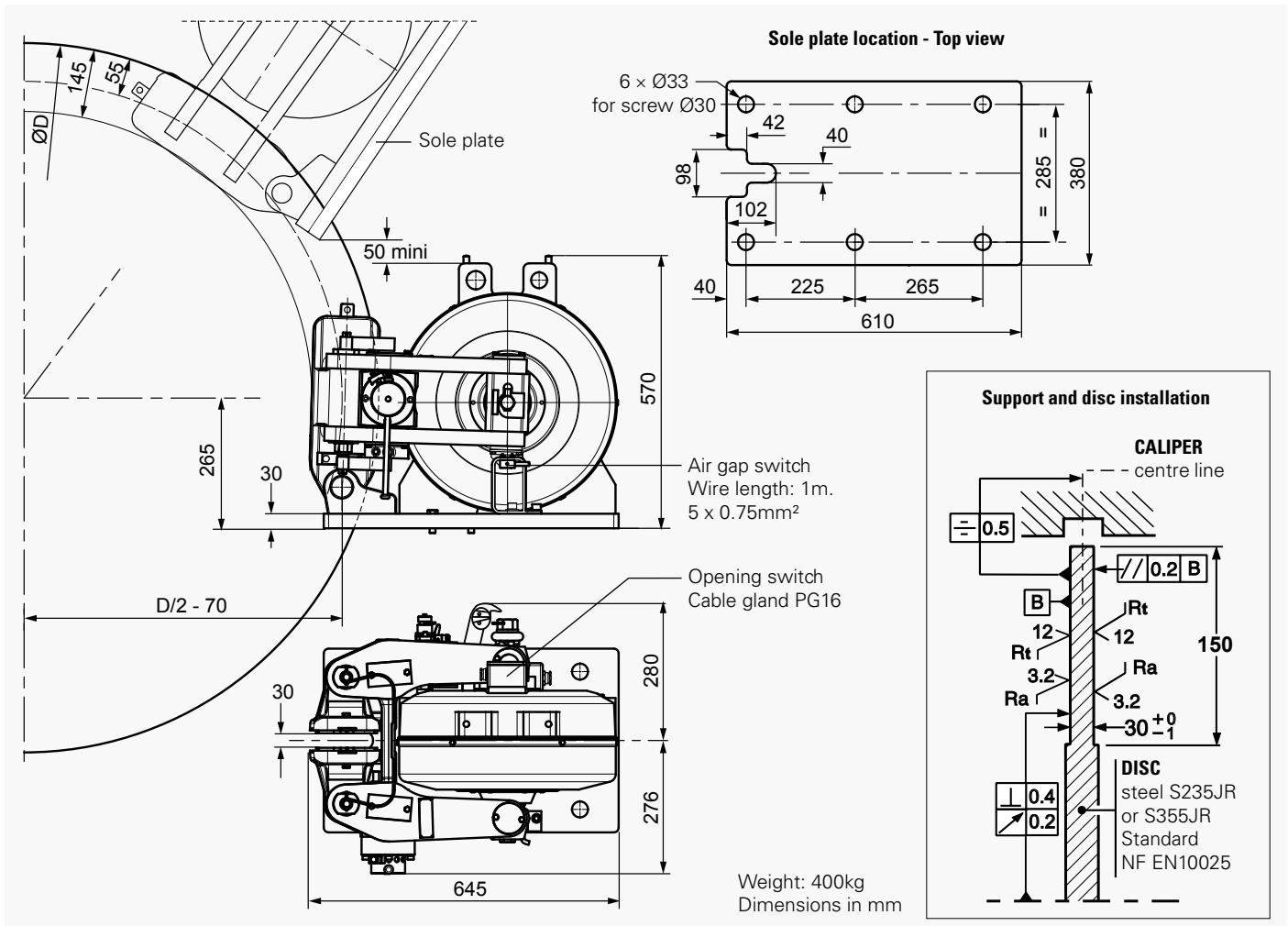
- Ambient temperature: -10°C to +60°C
 - Relative humidity ≤ 70%
 - Dust in atmosphere ≥ 65μ
- Other conditions, consult us.

Use:

The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains.

Options:

- Detection of full lining wear
- Load regulated lowering



•Opening proving switch

250VAC max., 5A max., with interrupting capacity: 50VA max.
220VDC max., 5A max., with interrupting capacity: 50W max.
Compatible with PLC (Programmable Logic Controllers).
An opening switch used with other equipment than PLC must not be reused with a PLC.

• Air gap switch

240V. 3A AC
250V. 0.27A DC

- * **US2-1:** disc temperature during one braking ≤ 150°C
- US2-5:** tdisc temperature during one braking ≤ 350°C

Designation	Caliper	2SA	
	Lining *	US2-1	US2-5
Braking force BF for 1mm of air gap disc/lining	Static N	90 000	84 600
	Dynamic N	100 000	94 000
Linear speed of the disc	m/s	≤ 10	≤ 10
Dynamic braking torque BT for 1 caliper and disc ØD (mm)	N.m	BT = BF(D/2000 - 0.055)	

ELECTRICAL POWER UNITS

POWER UNITS	MAINS	COIL (CALIPER)	OPTIONS
AS100-50 / AS100-220	230 to 500V AC	50V / 220V	CP = Polycarbonate casing CA = Steel casing H = Anticondensation kit R = Closure delay RD = Disengageable closure delay
AS100-50 700V	525 to 690V AC	50V	
DS100-50	1100 to 275V DC	50V	
DS100-220	220 to 275V DC	220V	
AS200-50	400 to 700V AC	50V	
4205	115 to 600V DC 115 to 500V AC	50V - 220V	CA or plate mounted version



MAIN CHARACTERISTICS

- | | |
|---|--|
| <ul style="list-style-type: none"> • DESIGNED TO GIVE OPTIMUM PERFORMANCE FROM THE ELECTROMAGNETIC CALIPERS • AC LINE SUPPLY: AS100, AS200 AND 4205 • DC LINE SUPPLY: DS100 AND 4205 | <ul style="list-style-type: none"> • HIGH "CALL" VOLTAGE TO REDUCE OPENING RESPONSE TIME • AUTOMATIC REDUCTION TO AN ECONOMICAL "HOLD" VOLTAGE • A "CUT-OUT" CIRCUIT GIVING A VERY SHORT BRAKE ACTION |
|---|--|



AS100 / DS100

- The caliper opening and closing are controlled by mains presence or not
- Max and Eco currents injected in the caliper(s) is regulated at values defined by the switch S2



AS200

- The caliper opening and closing are controlled by mains presence or not
- Max and Eco currents injected in the caliper(s) is regulated at values defined by the switches S1 and S2



4205

- is designed to control:
- opening and closing of the emergency brakes
 - progressive release of the electrical calipers from 100% to 50% of the nominal torque allowing lowering manoeuvres by manual control



The module **MFB 230/500V** is optional.

It is especially designed to accelerate the closing of the brakes associated to the electrical power units AS100-50 and AS100-220. Opening and closing of the caliper are controlled by the presence or not of the alternating power supply (230 to 500VAC +/-10%).

The **MFB** module when associated with a Stromag France power unit allows a fast closing of the associated brakes and this particularly when the braking torque is reduced. Consult us.

Electrical Power Units

ELECTRICAL POWER UNIT - AS100-50 CA

Revision number: T10035-01-D

Revision date: 16.06.2024

Compact power supply operating on alternating single or two-phase mains.
For SIME disc brakes with 50 V coil.
type: 3CA2 - OSA - OOSA
Steel case

Operating Conditions:

- Casing protection standard IP66 IK10
- Ambient temperature: -20°C to +60°C

Electrical Data:

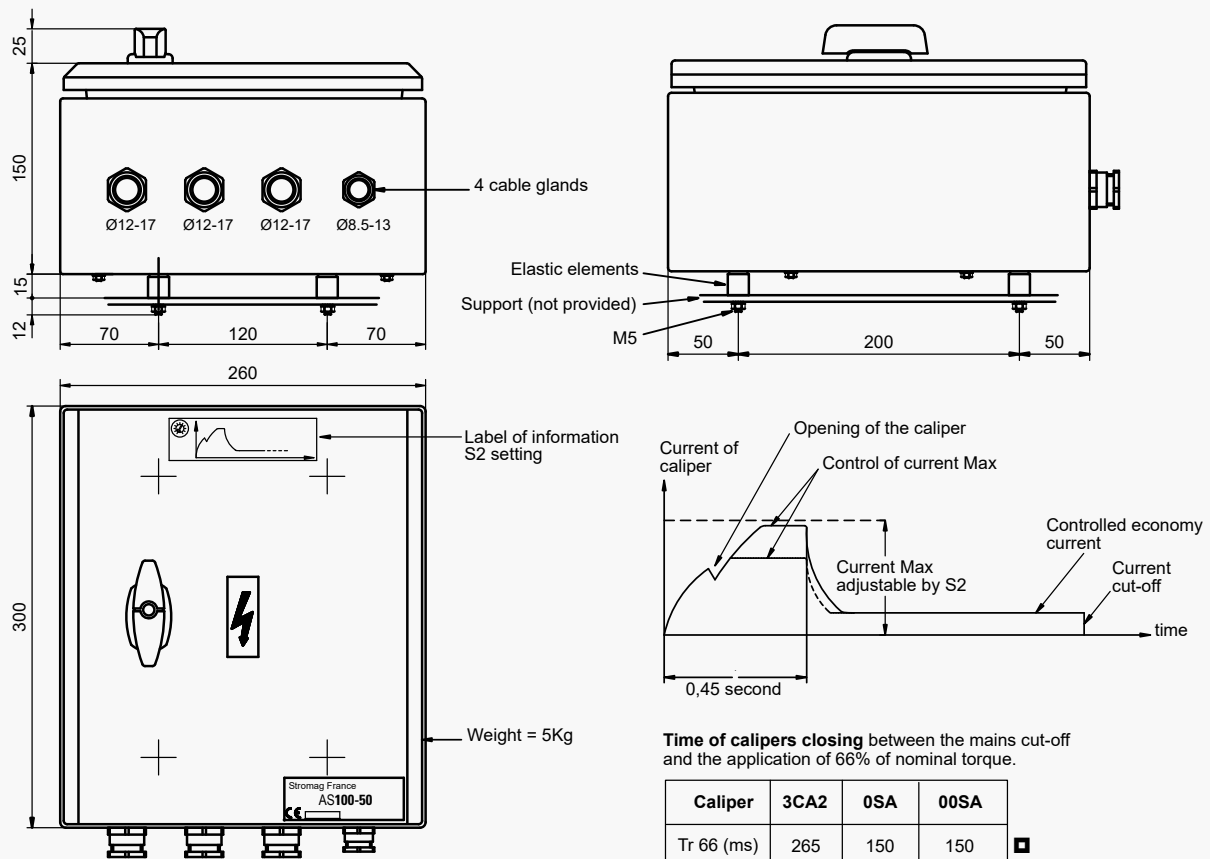
Single or two-phase mains AC
230 to 500V AC $\pm 10\%$ 50/60Hz

EC marking of conformity:

- 2006/95/CE directive Low Voltage (standard EN60204-1)
- 2004/108/CE directive EMC (standards EN61000-6-2 and EN61000-6-4)

Options:

- Closure delay of the caliper
- Disengageable closure delay of the caliper (cannot be combined with anti-condensation)
- Anti-condensation kit
- Steel case IP66 IK08
- DS100-50 power unit for DC mains



Time of calipers closing between the mains cut-off and the application of 66% of nominal torque.

Caliper	3CA2	OSA	OOSA
Tr 66 (ms)	265	150	150

Caliper			3CA2		OSA		OOSA
Maximum number of calipers			1	2	1	2	1
Resistance at 20°C per electromagnet Ω			1.01	1.01	1.01	1.01	1.01
Maximum number of actuations per hour and ambient temperature θ	$\theta \leq 40^\circ\text{C}$		600	600	100	100	100
	$\theta \leq 60^\circ\text{C}$		300	300	100	100	100
Mains current absorbed	Max	A	28	36	28	36	36
	Economy	A	3.5	3.6	3.5	3.6	3.6
Maximum connecting cable return resistance between caliper and supply unit Ω			3.5	1	3.5	1	1
Maximum connecting cable length (caliper input) according to the cable section	2.5 mm ²	m	170	50	170	50	50
	4 mm ²	m	275	80	275	80	80
	6 mm ²	m	415	120	415	120	120
	10 mm ²	m	715	205	715	205	205
Protection to be provided in head of control contactor on mains input	Fuse aM	A	6	8	6	8	8
	Circuit-breaker curve C	A	16	16	16	16	16

ELECTRICAL POWER UNIT - AS100-50 CP

Revision number: T10035-01-D

Revision date: 16.06.2024

Compact power supply operating on alternating single or two-phase mains.
For SIME disc brakes with 50 V coil.
type: 3CA2 - OSA - OOSA
Polycarbonate case

Operating Conditions:

- Casing protection standard IP66 IK08
- Ambient temperature: -20°C to +60°C

Electrical Data:

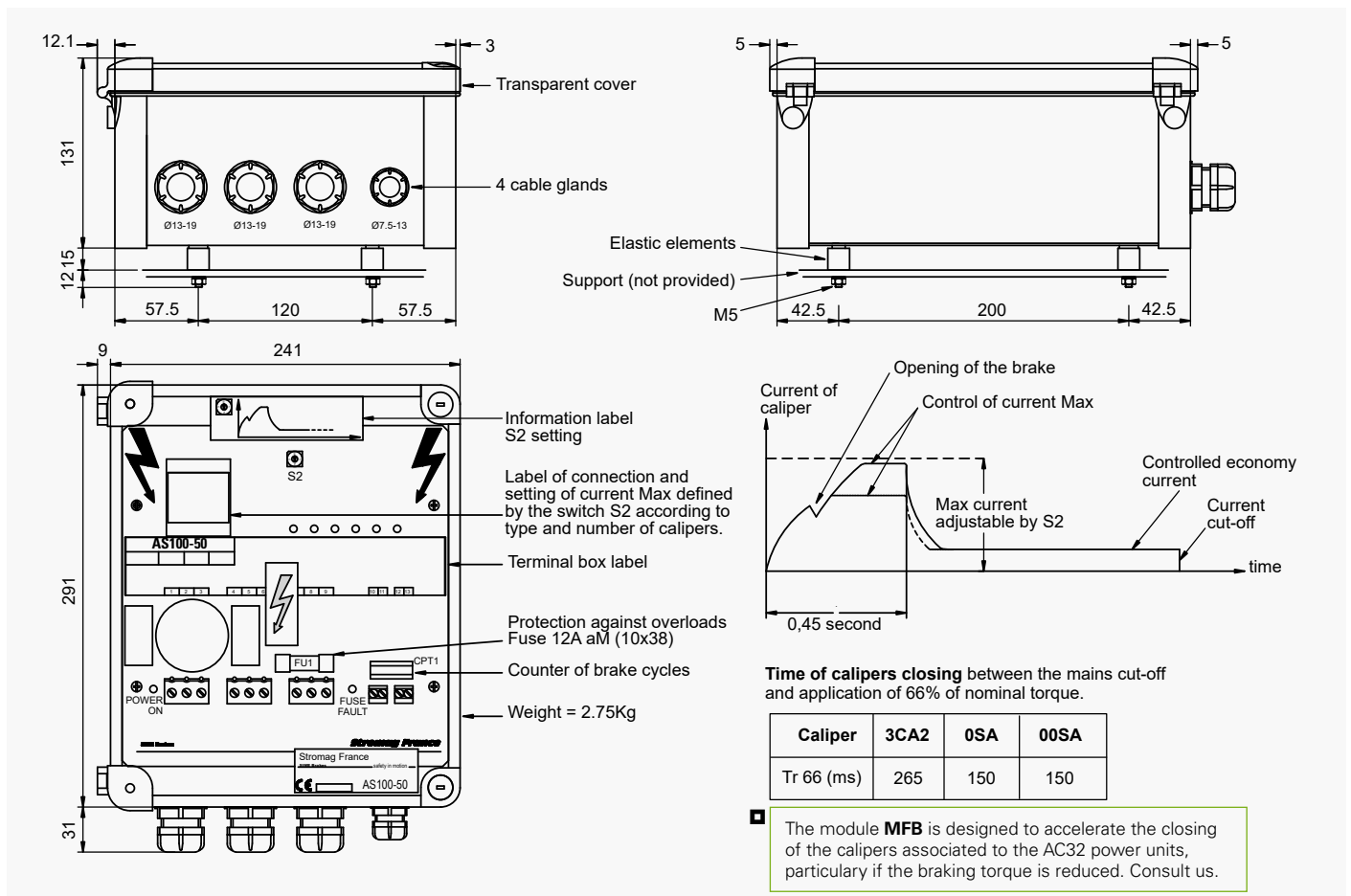
Single or two-phase mains AC
230 to 500V AC $\pm 10\%$ 50/60Hz

EC marking of conformity:

- 2006/95/CE directive Low Voltage (standard EN60204-1)
- 2004/108/CE directive EMC (standards EN61000-6-2 and EN61000-6-4)

Options:

- Closure delay of the caliper
- Disengageable closure delay of the caliper (cannot be combined with anti-condensation)
- Anti-condensation kit
- Steel case IP66 IK10
- DS100-50 power unit for DC mains



ELECTRICAL DANGER: THIS PRODUCT IS NOT INSULATED

Control and power electronic of power supply is not insulated and is under mains voltage. The power supply must be installed by qualified personnel, used to handle this equipment type and aware of risks inherent in their utilization.

Electrical Power Units

ELECTRICAL POWER UNIT - AS200-50 CA

Revision number: T10210-01-C

Revision date: 06.03.2024

Compact power supply operating on alternating single or two-phase mains.
For disc brakes Stromag France with 50 V coil type : 3CA2 - 2CA2 - OSA - OOSA - 2S - 2SA
Steel case

Operating conditions:

- Casing protection standard IP66 IK10
- Ambient temperature: -20°C to +60°C

Electrical data:

Single or two-phase mains AC
400 to 700V AC $\pm$ 10% 50/60Hz

EC marking of conformity:

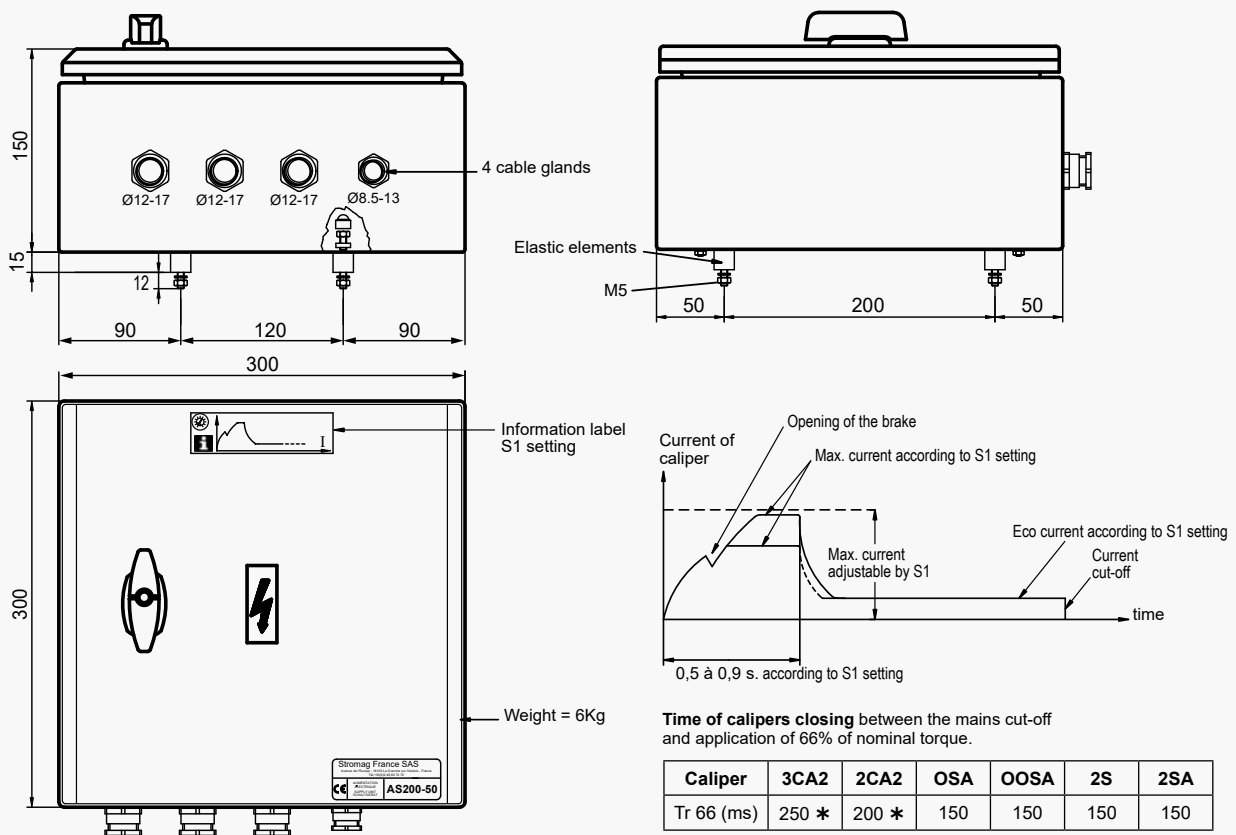
2006/95/EC directive BT (standard EN60204-1)
2004/108/EC directive EMC (EN61000-6-2 EN61000-6-4)

Options:

- Closure delay of the caliper
- Disengageable closure delay of the caliper (cannot be combined with anti-condensation)
- Anti-condensation kit
- Polycarbonate case IP66 IK08

ELECTRICAL DANGER: THIS PRODUCT IS NOT INSULATED

Control and power electronic of power supply is not insulated and is under mains voltage.



Time of calipers closing between the mains cut-off and application of 66% of nominal torque.

Caliper	3CA2	2CA2	OSA	OOSA	2S	2SA
Tr 66 (ms)	250 *	200 *	150	150	150	150

Caliper			3CA2		2CA2		OSA		OOSA	2S		2SA		
Max. number of calipers			1	2	1	2	1	2	1	1	2	1	2	
Resistance at 20°C per electromagnet			Ω		1,01		0,75		1,01		1,01		0,75	
Maximum number of actuations per hour and ambient temperature θ	θ ≤ 40°C		1000		300		100		100		100		100	
	θ ≤ 60°C		600		600		100		100		50		50	
Mains current absorbed	Max	A	18	24	29	38	26	34	34	45	58	52	67	
	Economy	A	1	1.5	1.5	2	3	4	4	2.5	3	2.5	3	
Maximum connecting cable return resistance between caliper and supply unit			Ω		2.5	1	2	1	2.5	1	1	0.5	1	0.5
Max. connecting cable length (caliper-input) according to the cable section. ♦	2,5 mm²	m	125	50	100	50	100	50	50	50	25	50	25	
	4 mm²	m	200	80	160	80	200	80	80	80	40	80	40	
	6 mm²	m	300	120	240	120	300	120	120	120	60	120	60	
	10 mm²	m	500	200	400	200	500	200	200	200	100	200	100	
Protection to be provided in head of control contactor on mains input	Fuse aM	A	6		8		8		8		12		12	
	Circuit-breaker curve C	A	16		16		16		16		20		20	

♦ 2 calipers: Cable length for series connection to AS200-50 power supply terminal block. If series connection is made at the calipers, the cable length is multiplied by 2.

ELECTRICAL POWER UNIT - AS200-50 CP

Revision number: T10210-01-C

Revision date: 06.03.2024

Compact power supply operating on alternating single or two-phase mains.
For SIME Disc Brakes with 50 V coil.
type : 3CA2 - 2CA2 - OSA - OOSA - 2S - 2SA
Polycarbonate case

Operating conditions:

- Casing protection standard IP66 IK08
- Ambient temperature: -20°C to +60°C

Electrical data:

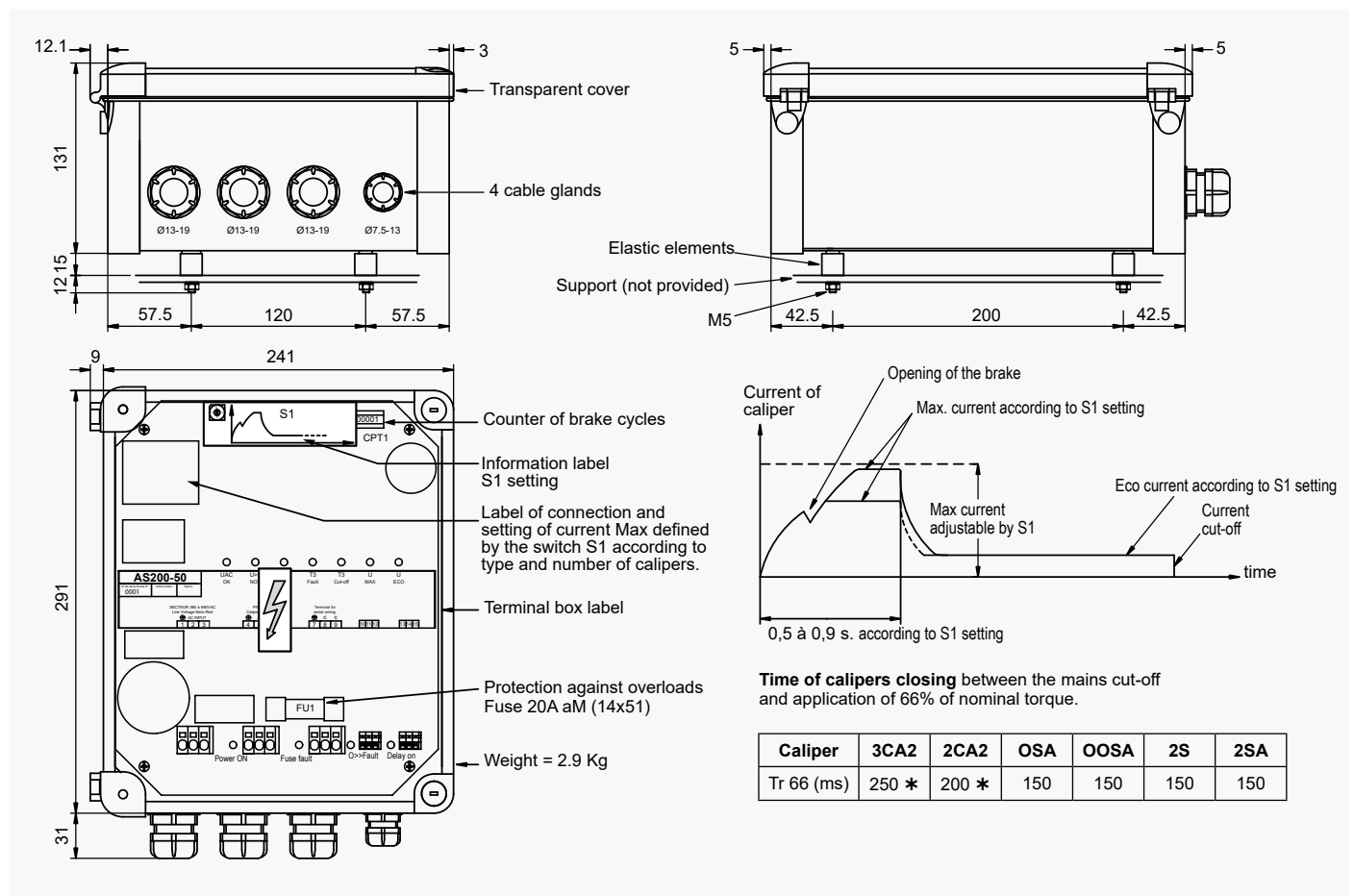
Single or two-phase mains AC
400 to 700V AC $\pm 10\%$ 50/60Hz

EC marking of conformity:

- 2006/95/EC directive Low Voltage (standard EN60204-1)
- 2004/108/EC directive EMC (standards EN61000-6-2 and EN61000-6-4)

Options:

- Closure delay of the caliper
- Disengageable closure delay of the caliper (cannot be combined with anti-condensation)
- Anti-condensation kit
- Steel case IP66 IK10



ELECTRICAL DANGER: THIS PRODUCT IS NOT INSULATED

Control and power electronic of power supply is not insulated and is under mains voltage. The power supply must be installed by qualified personnel, used to handle this equipment type and aware of risks inherent in their utilization.

* NOTE - 3CA2 and 2CA2 calipers :

To obtain a **tr66 < 150 ms**, use a AC32-50 power supply + the MFB (Fast Braking) option.

If the braking torque is set to a value lower than the nominal torque (30% max.), use of an AC32-50 power supply is mandatory to limit the maximum inrush air gap (3 mm).

The braking torque reduction leading to the increase of the tr66 time

→ use of AC32-50 + MFB option is recommended.

Electrical Power Units

ELECTRICAL POWER UNIT - 4205

Revision number: T04810-01-B

Revision date: 21.10.2015

Designed for normal control or progressive release of electrical calipers to perform lowering maneuvers.

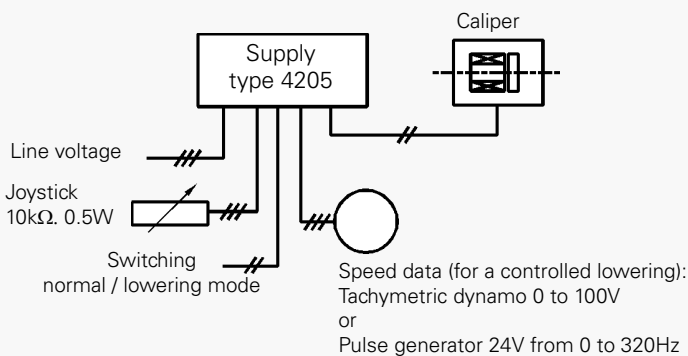
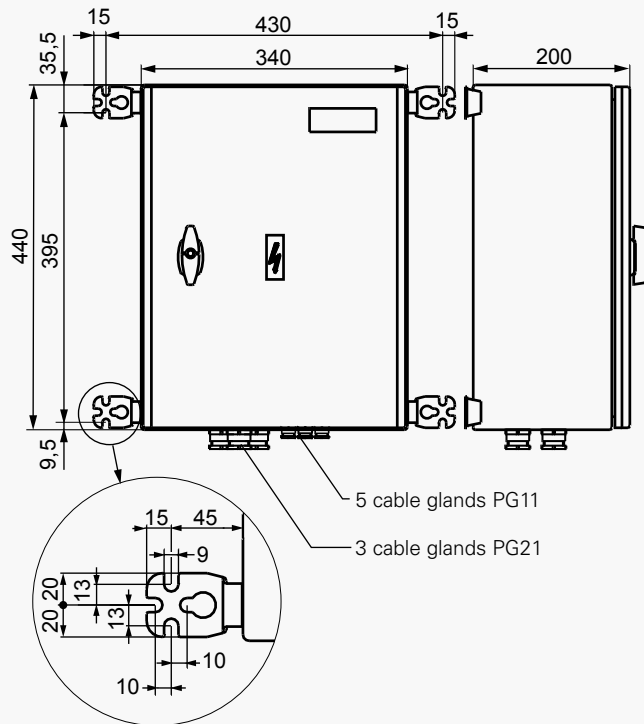
2 presentations are available:
- C for casing protected version
- P for plate mounted version

Operating conditions:

- Line voltage:
 - direct: 115V to 600VDC $\pm 10\%$
 - single or three phases: 115V to 500VAC $\pm 10\%$ 50/60Hz
- Ambient temperature: -20°C to +55°C

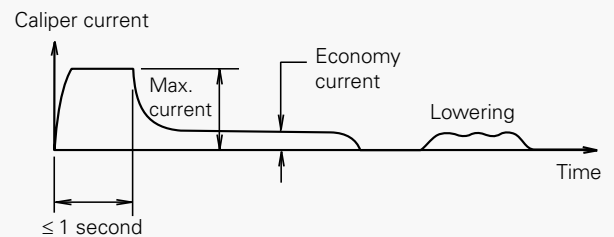
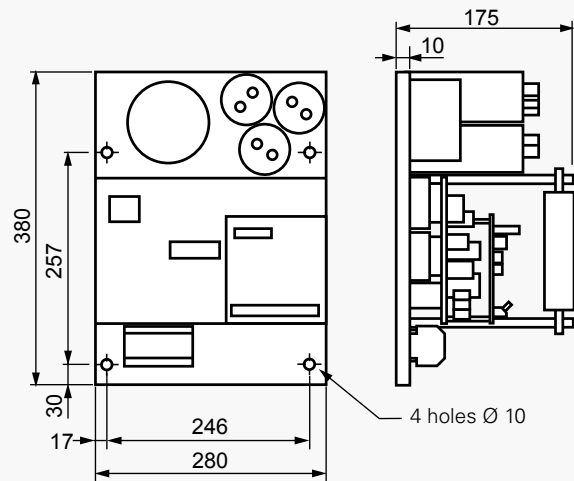
Type C4205 casing protected version (casing IP 66 EN60529)

Weight: 17kg



Type P4205 plate mounted version (for cabinet assembly)

Weight: 8kg



ELECTRICAL POWER UNIT - 4205

Revision number: T04810-01-B

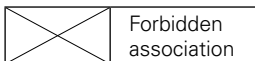
Revision date: 21.10.2015

Notes:

- Lowering a load is performed manually, with or without vertical speed control, by progressively releasing the calipers (between 100% and 50% of the nominal torque)
- 2 calipers driven by the same power supply (or the 2 coils of the caliper OOSA) must be connected in series (refer to the installation and maintenance leaflet)
- For lowering with calipers 4CA2, contact us.

Note: by insulated kinematics (e.g.: a drum), the lowering command is performed only for one of the **4205** electrical supply units. This unit is called the "master".
One "master" unit can drive up to 5 "slave" units.

CALIPER			Type Number		4CA2		3CA2		OSA		00SA	2SA	
			1	2	1	2	1	2	1		1	2	
Maximum number of actuations per hour at 40°C			700		1000		100				100		
Power consumption of the power supply	Maximum	W	1695	3215	1355	2480	2850	5380	5380	8205	15 815		
	Economy	W	105	140	130	175	305	480	480	205	300		
Max. connecting cable return resistance caliper to supply unit (for 1 coil)		Ω	1		1		1				1	1	
Delayed fuse rating to be provided between power supply and mains:													
direct:	115 VDC	A	25		25		25						
	230 VDC	A	25		25		25		35				
	400 to 600 VDC	A	25		25		25		35		35		
single phase:	115 VAC	A	25		25		25						
	230 VAC	A	25		25		25		35				
	400 VAC	A	25		25		25		35		35		
	500 VAC	A	25		25		25		25		25		
3 phases:	230 VAC	A	25		25		25		25				
	400 VAC	A	16		16		16		25		25		
	500 VAC	A	16		16		16		16		16		

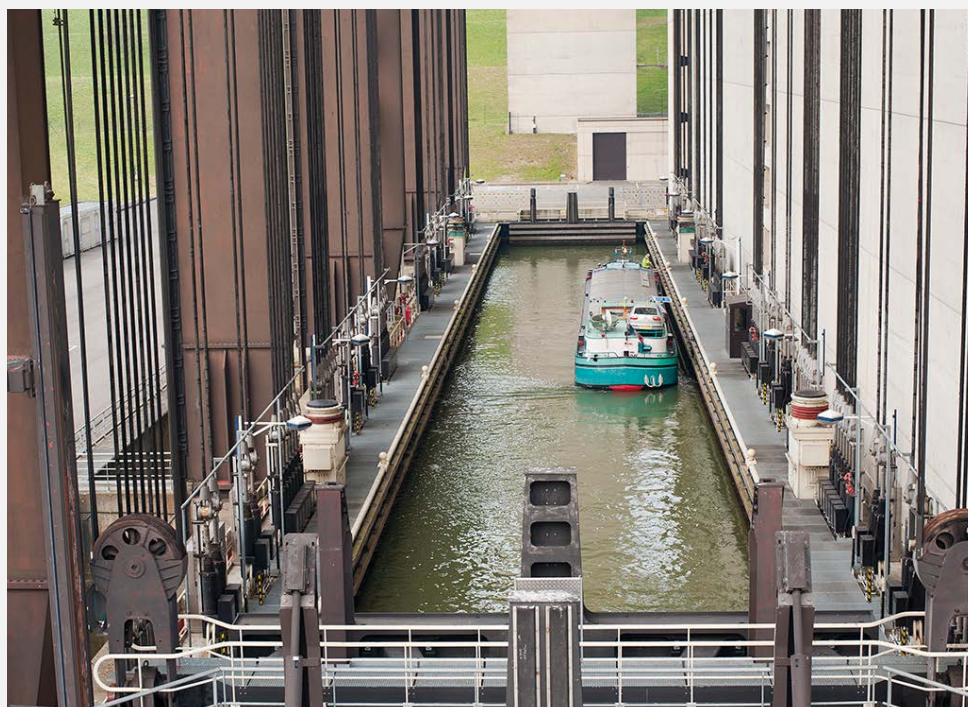


Forbidden
association

HYDRAULIC EMERGENCY BRAKES TYPE SH

APPLICATIONS

- | | |
|---|---|
| <ul style="list-style-type: none">• STEEL CRANES• PORT CRANES• NUCLEAR CRANES | <ul style="list-style-type: none">• OFFSHORE APPLICATIONS• BOATLIFTS• MINES AND CONVEYORS |
|---|---|



MAIN CHARACTERISTICS	OPTIONS
• FAILSAFE BRAKE BY SPRING APPLICATION • HYDRAULIC RELEASE • OPENING PROVING SWITCH • LINING WEAR INDICATORS	• LINING WEAR PROVING SWITCH • PROGRESSIVE BRAKING SYSTEM • OFFSHORE PROTECTION • LINING TEMPERATURE SENSOR • HIGH TEMPERATURE, IRON AND STEEL CONDITIONS



SH

- Association with disc thicknesses: depending on the type of caliper: 12.7 - 15 - 20 - 30 or 42 mm.



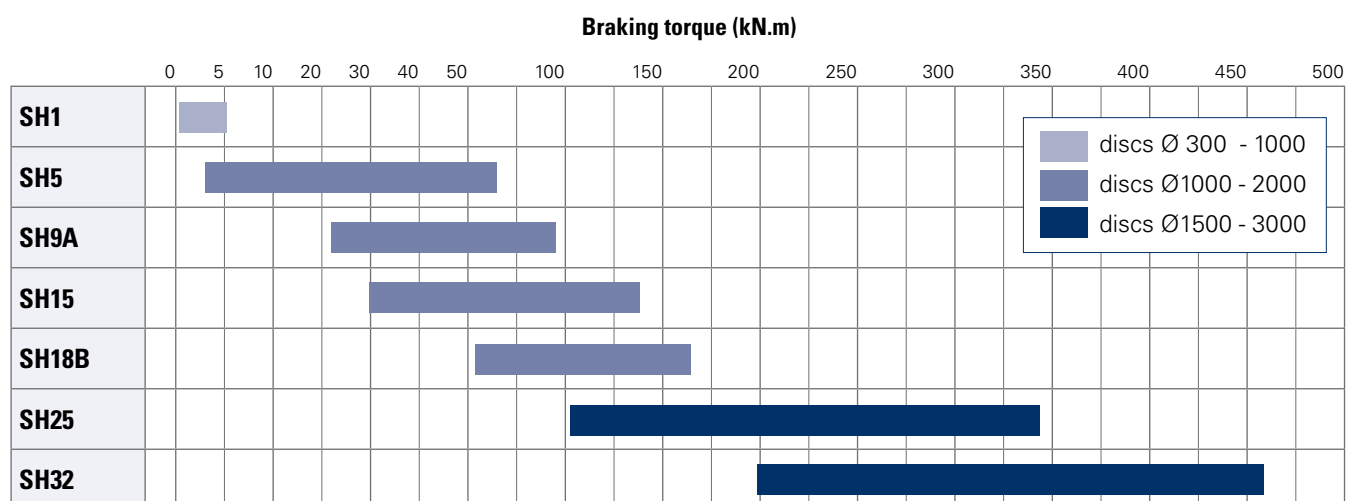
SHV

- Caliper mounted on a support
- Tailor-made solutions for any installation : banana supports



SHV-SHPU (1, 2 or 3)

- Caliper and Hydraulic Power Pack mounted on the same support
- Option: Electrical unit

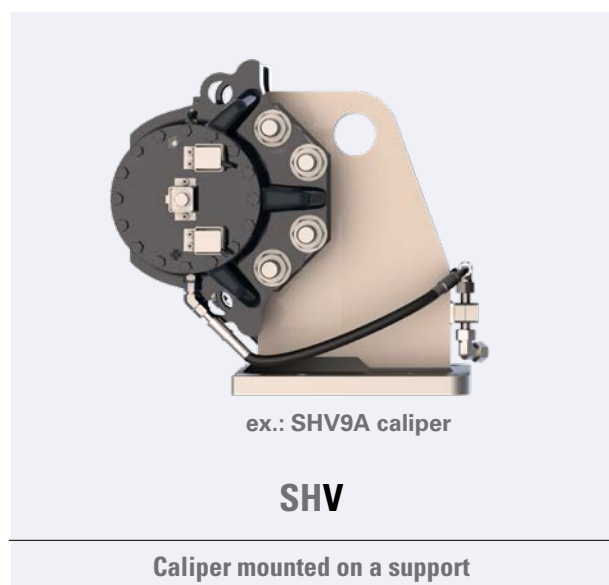
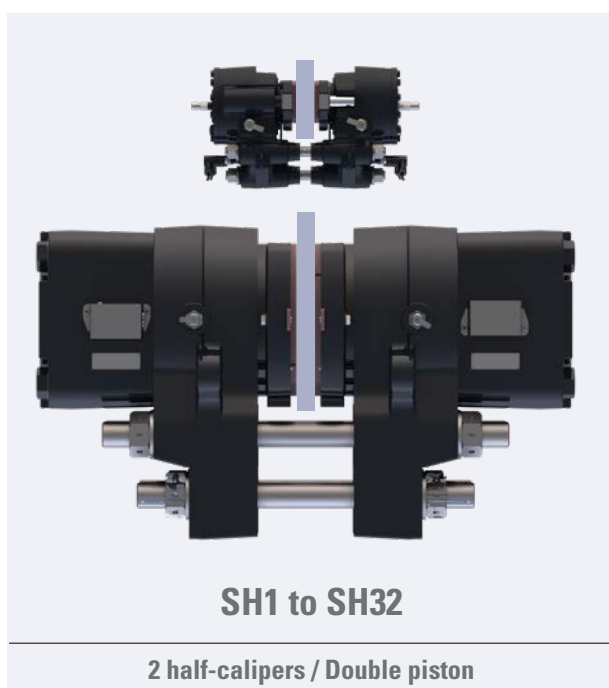


Emergency Brakes

DISC BRAKE - SH - SHV - SHS CALIPERS

The calipers **SH** are powerful hydraulic brakes with a symmetrical design, they are specially designed to operate in severe conditions. Floating calipers **SHF** are tailor-made according to the customer's installation, contact us.

The hydraulic calipers **SH** can be delivered mounted on a support, with or without: Hydraulic Power Pack, junction box, electrical control unit, SIMAN intelligent management system. Several calipers can be mounted on the same tailor-made support.



DISC BRAKE - SH - SHV - SHS CALIPERS



	SHPU1
SHV5	Tank 5l, 0.37kw
SHV9A	Tank 5L, 0.75kW
SHV15/18B	Tank 5L, 2.2kW
SHV25	
SHV32	

	SHPU2
SHV5	Tank 8L, 2.2kW
SHV9A	
SHV15/18B	Tank 11L, 2.2kW
SHV25	
SHV32	

	SHPU3 MOPS - SB
SHV5	Tank 8L, 2.2kW
SHV9A	
SHV15/18B	
SHV25	
SHV32	

See SHPU data sheets



SHVxx-SHPU1	K-BA	Basic electrical unit
	K-TB	Terminal Box

SHVxx-SHPU2	K-BA	Basic electrical unit
	K-TB	Terminal Box
	K-PR	Premium Electrical unit
	K-SI	Electrical unit with SIMAN for control, monitoring and safety functions

For SHVxx- SHPU3 with electrical unit, consult us.

Emergency Brakes

DISC BRAKE - SH1 CALIPER

Revision number: T10097-01-I

Revision date: 15.09.2021

Emergency brake

Fail to safe

Spring application

Hydraulic release

Linings with wear indicators

Holding tool for maintenance operation

Manual wear centering and compensation

Association with discs thickness:

12.7 (1/2"), 15, 20 and 30mm.

Lining pads type **US2-1** or **ES3-7**

Lining pads with full wear indicators

Protection C5-M M

Operating conditions:

- Ambient temperature:
Dynamic braking: -30°C to +70°C
Brake applied (parking): -40°C to +70°C
- Relative humidity: ≤ 70%
- Dust in atmosphere ≥ 65µm
- Other conditions: consult us.

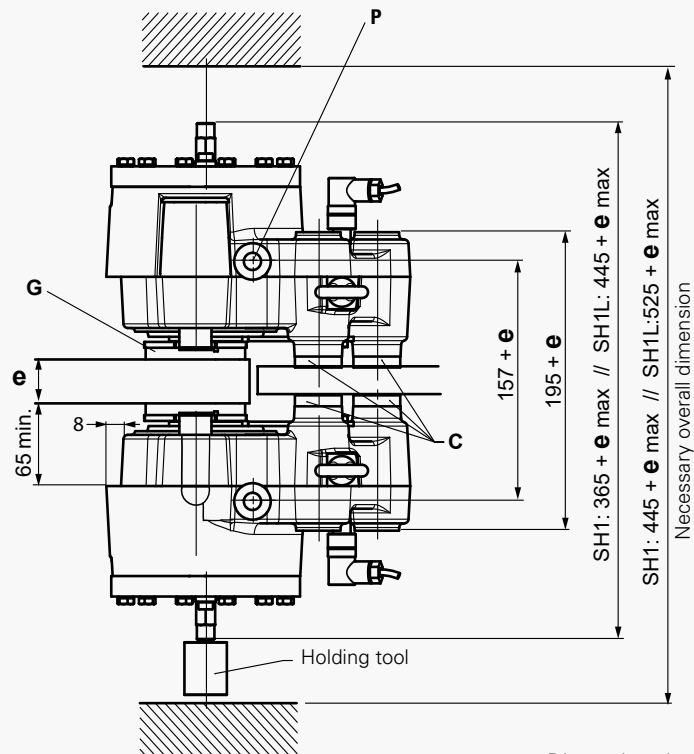
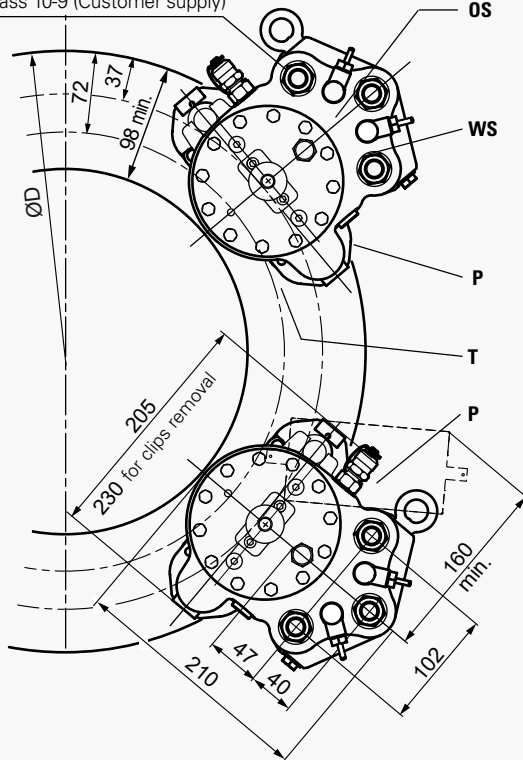
Use:

- The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains.
- Other use, consult us.

Options:

- Opening proving switch (**OS**)
- Lining wear proving switch (**WS**)
- All non-standard disc thickness > 12.7mm (1/2")
- Lining temperature sensor (**T**)
- Mechanical release tool (**DM**)
- SH1L**: caliper requiring no manual wear compensation:
 - braking force before lining wear = +10% maxi.
 - braking force after lining wear = -10% maxi.

3 holes Ø17 for tie rods M16
class 10-9 (Customer supply)



Dimensions in mm
Weight = 35 kg

Electrical data:

Inductive switches of opening and wear (options):

- 3 wires PNP NO
- 12 to 24 VDC 200mA
- with male connector M12 / 5 positions
- according to standard IEC61076-2-101 / code A

Sensor PT100 (option)

- Detection of the temperature
- threshold: 100°C ± 5
- Cable length = 2.5 meters
- 2 wires red/yellow

C = Spacers according to disc thickness

G = Linings: Thickness of new lining 8 mm

Thickness to wear 6 mm

Each 1mm of wear on each side: manual centering and compensation

OS = Opening switch (option)

WS = Lining wear switch (option)

P = 2 oil ports 1/4"G per half-caliper

Pressure taps delivered separately

T = PT100 sensors (option)

ØD = Disc diameter = 300 mm minimum

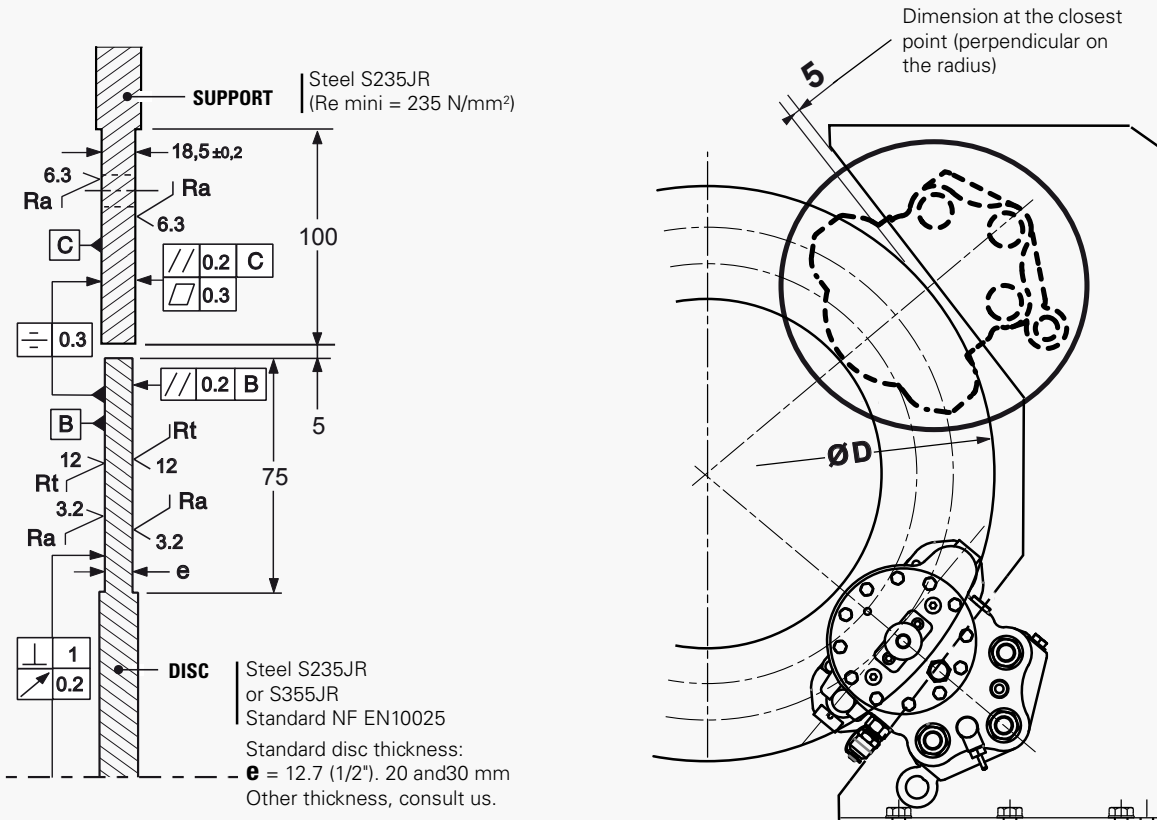
e = Disc thickness

DISC BRAKE - SH1 CALIPER

Revision number: T10097-01-I

Revision date: 15.09.2021

Disc and support:



Torque and effort values are subject to a variation of $\pm 10\%$ - Response time at nominal torque $\leq 0.3s$

Designation	Caliper SH1-		5	4	3	2	1	5	4	3	2	1
	Lining *		US2-1					ES3-7				
Braking force BF for air gap disc/lining of 2x1mm	Dynamic	N	11 000	8 000	6 000	4 000	3 000	11 000	8 000	6 000	4 000	2 000
	Static	N	9 680	7 040	5 280	3 520	2 640	9 900	7 200	5 400	3 600	1 800
Linear speed of the disc ●		m/s	≤ 10					≤ 50				
Dynamic braking torque BT (m.N) for 1 caliper and disc ØD (mm) / 300 ≤ D ≤ 1000 mm		N.m	BT = BF (D/2000-0.037)									
Regulation pressure	Minimum	bar	150									
	Maximum	bar	170									
Setting pressure limit valve of hydraulic unit		bar	190									
Total volume of oil displaced for air gap disc/lining of:	2 x 1mm (nominal opening)	cm³	5 cm³									
	2 x 3mm (wear+opening)	cm³	13 cm³									
	2 x 7mm SH1L (wear+open.)	cm³	29 cm³									

* ES3-7: disc temperature during one braking $\leq 600^{\circ}\text{C}$

US2-1: disc temperature during one braking $\leq 100^{\circ}\text{C}$

● For higher speed, consult us.

Emergency Brakes

DISC BRAKE - SH5 CALIPER

Revision number: T03865-02-C

Revision date: 23.09.2010

Emergency brake
Fail safe
Spring application
Hydraulic release
Opening proving switches
Lining wear detector

Operating conditions:

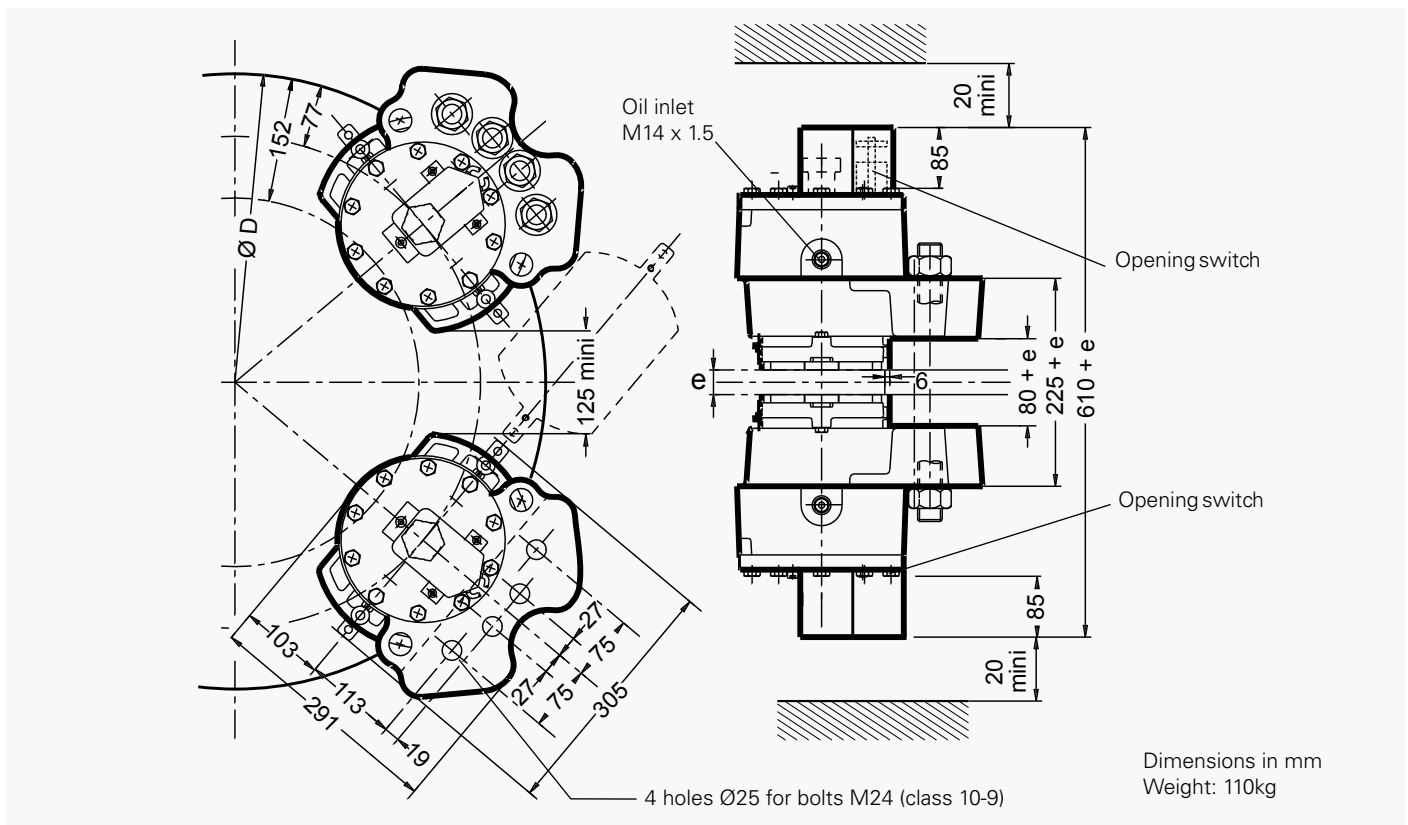
- Ambient temperature: -10°C to $+60^{\circ}\text{C}$
 - Relative humidity: $\leq 70\%$
 - Dust in atmosphere $\geq 65\mu$
- Other conditions: consult us.

Use:

- The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains. Other use, consult us.

Options:

- Automatic lining wear compensation (WACS)
- Lining wear control switch
- Progressive braking system
- Marine protection
- Caliper on support with integral hydraulic power unit



Opening proving switch:

250VAC maxi., 5A maxi.,
with interrupting capacity: 50VA maxi.

220VDC maxi., 5A maxi.,
with interrupting capacity: 50W maxi.

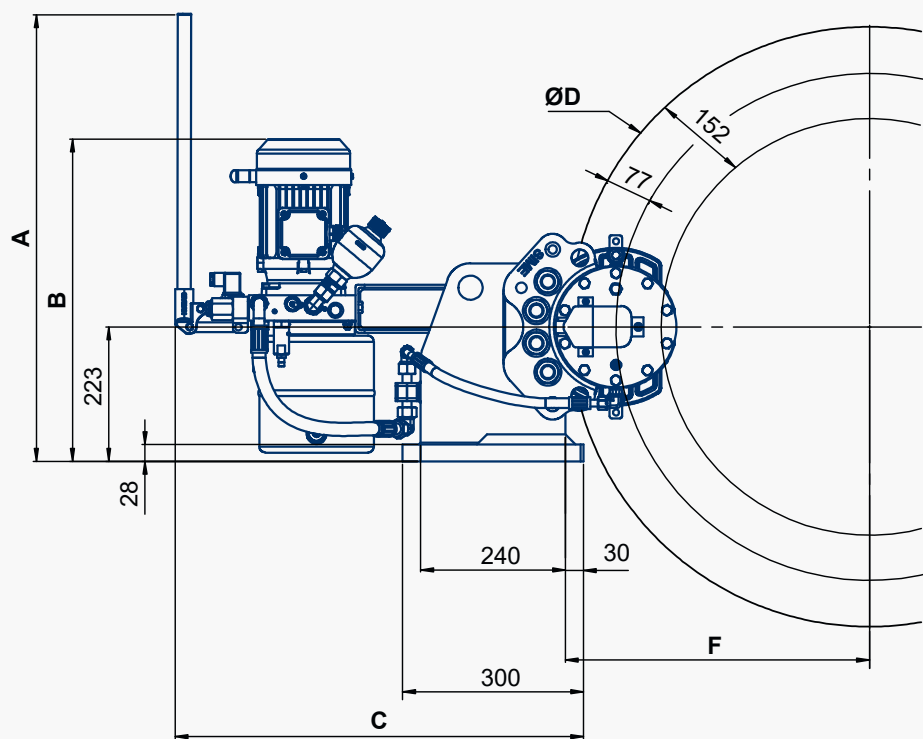
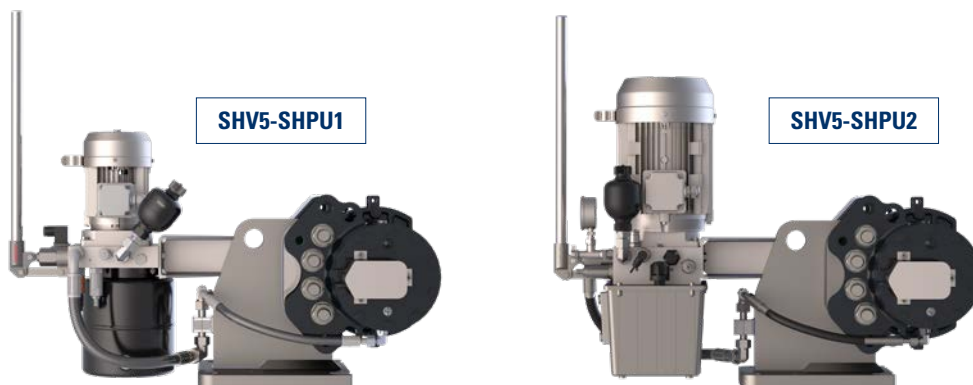
Compatible with PLC
(Programmable Logic Controllers).

An opening switch used with other equipment than PLC
must not be reused with a PLC.

DISC BRAKE - SHV5-SHPU CALIPER

Revision number: T10191-01-B

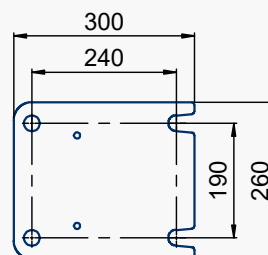
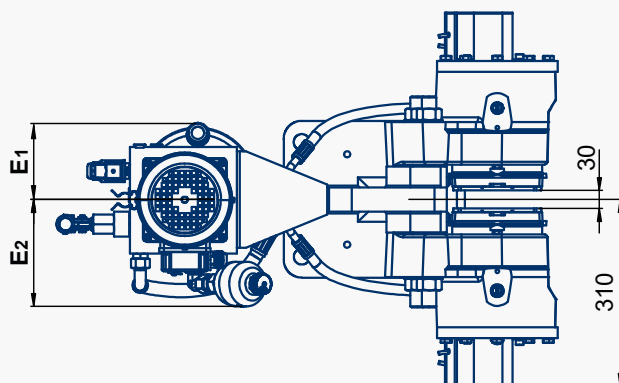
Revision date: 21.08.2023



SHV5-		SHPU1	SHPU2
A	mm	~745	~740
B		~535	~615
C		~700	~675
E1		127	221
E2		179	168
F		D/2 + 10	
Weight	kg	199	208
Motor	kW	0.37	2.2

Can be associated with the electrical control units:
K-TB or **K-BA** or **K-PR** or **K-SI**

See technical data in SH5 leaflet



4 trous Ø26
pour boulons M24 (classe 8-8)
lubrification avec MoS2
fournis par le client

Emergency Brakes

DISC BRAKE - SH9A CALIPER

Revision number: T10077-01-B

Revision date: 30.05.2013

Emergency brake
Fail safe
Spring application
Hydraulic release
Opening proving switches

Operating conditions:

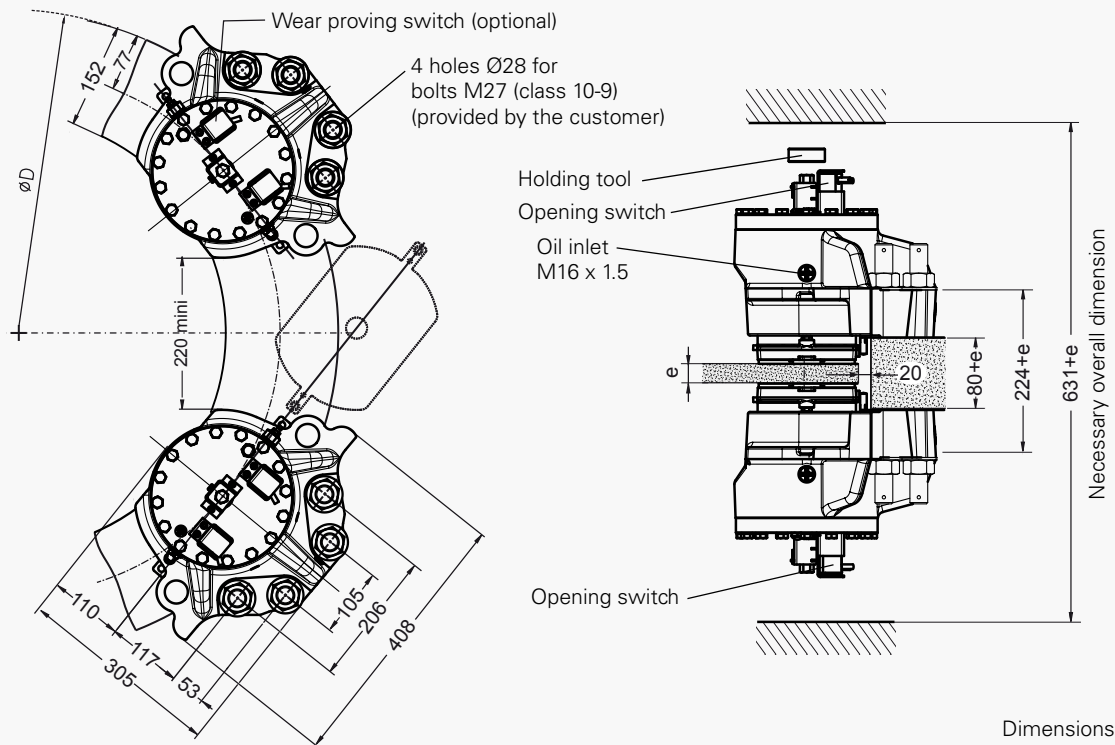
- Ambient temperature: -10°C to $+60^{\circ}\text{C}$
- Relative humidity: $\leq 70\%$
- Dust in atmosphere $\geq 65\mu$
- Other conditions: consult us.

Use:

- The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains. Other use, consult us.
- US2-1, US2-5 for low energy braking $\leq 1 \text{ MJ}$
- EF3-1 for high energy braking $\leq 15 \text{ MJ}$
- Other use, consult us

Options:

- Lining wear control switch
- Switch for P.L.C. (induction sensor)
- Marine protection
- Caliper on support with integral hydraulic power unit
- Option GF



Opening proving switch:

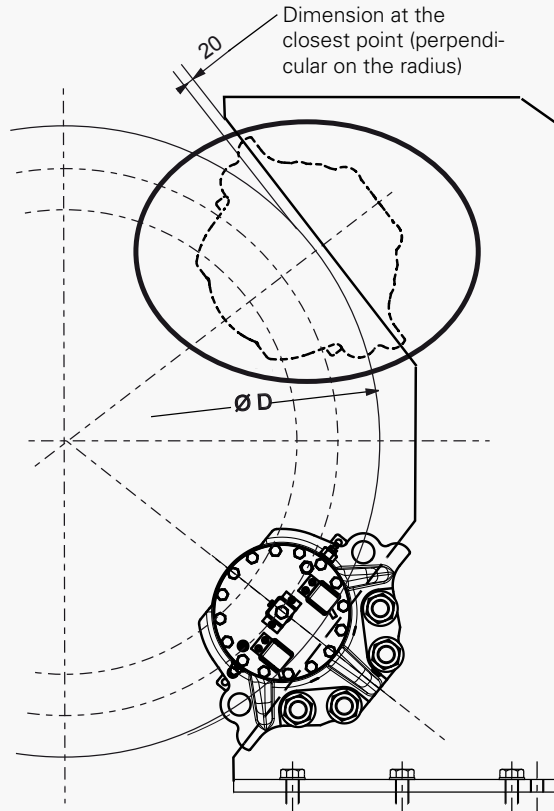
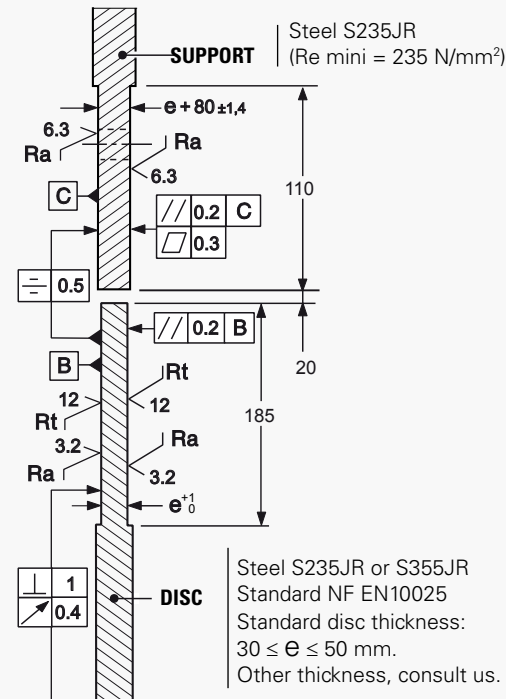
240V 1.5A AC
250V 0.1A DC
with a $5 \times 0.75\text{mm}^2$ wire
of 5m length

DISC BRAKE - SH9A CALIPER

Revision number: T10077-01-B

Revision date: 30.05.2013

Disc and support:



Torque and effort values are subject to a variation of $\pm 10\%$
Response time at nominal torque $\leq 0.3s$

Designation	Caliper		SH9A-3			SH9A-2			SH9A-1		
	Lining *		US2-1	US2-5	EF3-1	US2-1	US2-5	EF3-1	US2-1	US2-5	EF3-1
Braking force BF for 1mm air gap	Static	N	94 500	90 000	70 500	80 100	76 200	60000	66 150	63 000	49 600
	Dynamic	N	105 000	100 000	78 200	89 000	84 700	66 500	73 500	70 000	55 000
Linear speed of the disc for BF		m/s	≤10	≤30	≤ 50●	≤10	≤30	≤ 50●	≤10	≤30	≤ 50●
Dynamic braking torque BT (N.m) for 1 caliper and disc ØD (mm) **	995 mm	N.m	44 150	42 050	32 880	37 420	35 620	27 960	30 910	29 440	23 130
	1500 mm	N.m	70 670	67 300	52 630	59 900	57 000	44 750	49 470	47 110	37 020
	2000 mm	N.m	96 920	92 300	72 180	82 150	78 180	61 380	67 840	64 610	50 770
BT for other ØD (mm)		N.m	BT = BF (D/2000 - 0.077)								
Regulation pressure	Minimum	bar	180			150			110		
	Maximum		200			180			140		
Setting pressure of HPP limit valve		bar	225			210			165		
Total volume of oil displaced		cm³	55 for one disc/linings stroke (nominal wear and opening)								

* **US2-1:** disc temperature during one braking $\leq 150^\circ\text{C}$
US2-5: disc temperature during one braking $\leq 350^\circ\text{C}$
EF3-1: High energy braking, disc temperature during one braking $\leq 600^\circ\text{C}$

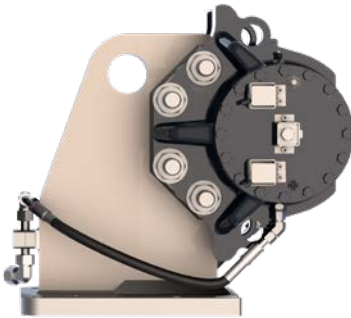
** For disc ØD < 995 mm, consult us.

● For higher speed, consult us.

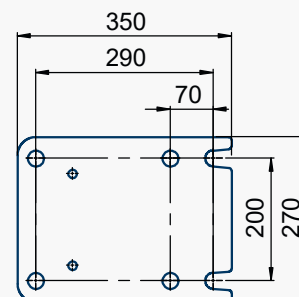
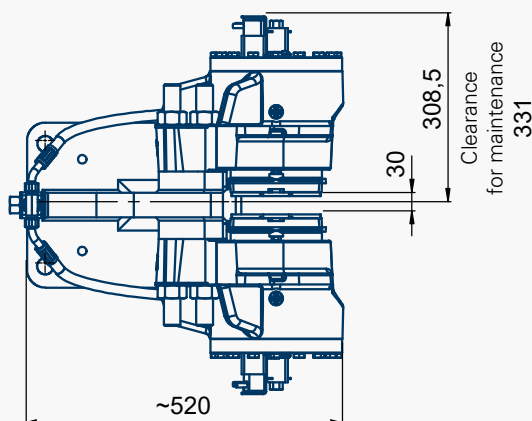
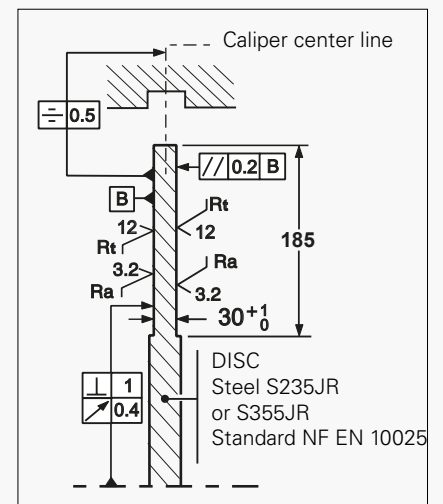
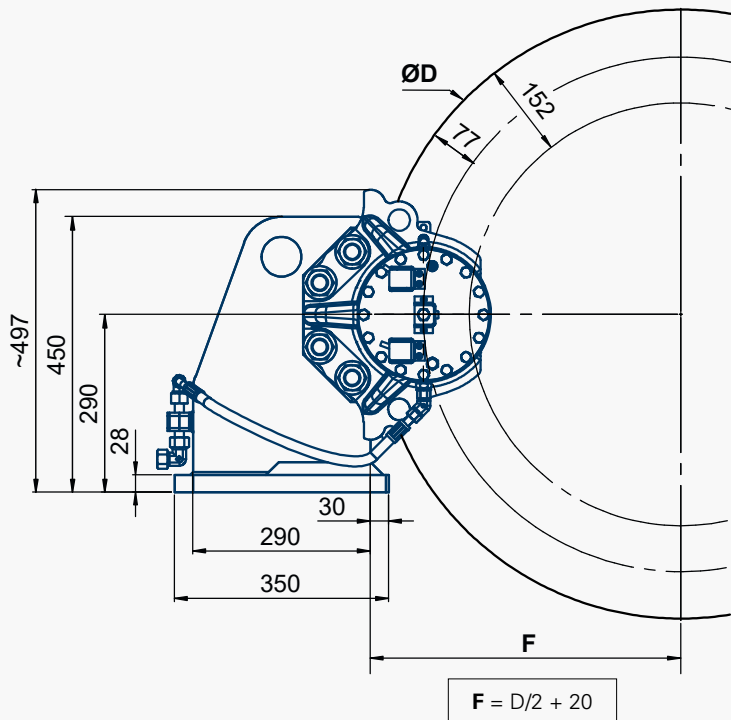
DISC BRAKE - SHV9A CALIPER

Revision number: T10192-01-D

Revision date: 31.03.2025



- Caliper mounted on a support
- Hydraulic connection for SHPU Hydraulic Power Pack
- Opening switches
- Lining wear switches (optional)
- Full lining wear indicator wires
- See technical data in SH9A leaflet
- Weight = 207 kg

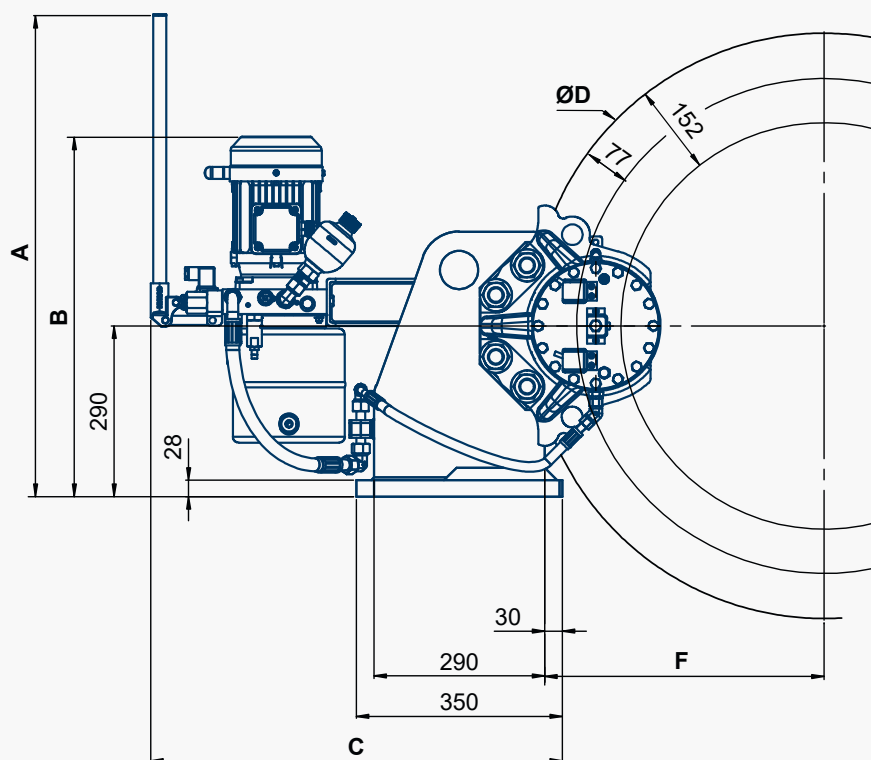
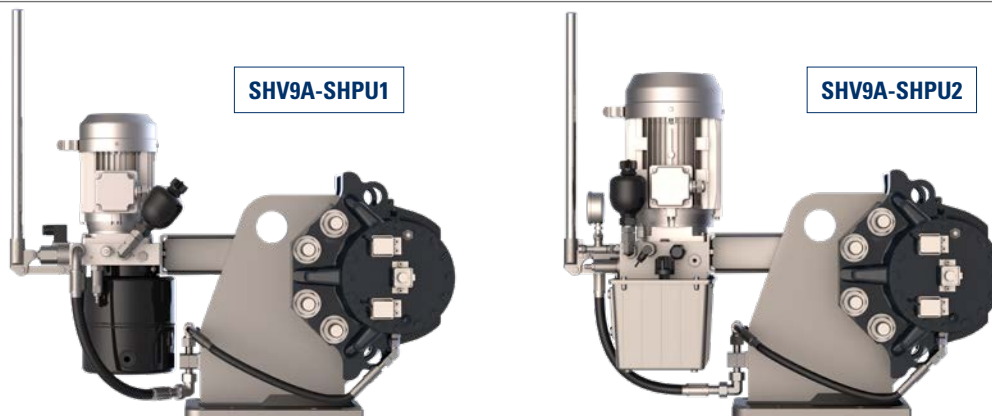


6 holes Ø26 for bolts M24 (class 8-8)
lubrication with MoS2
provided by the customer

DISC BRAKE - SHV9A-SHPU CALIPER

Revision number: T10192-01-D

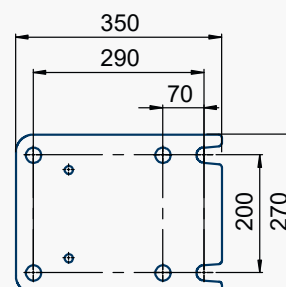
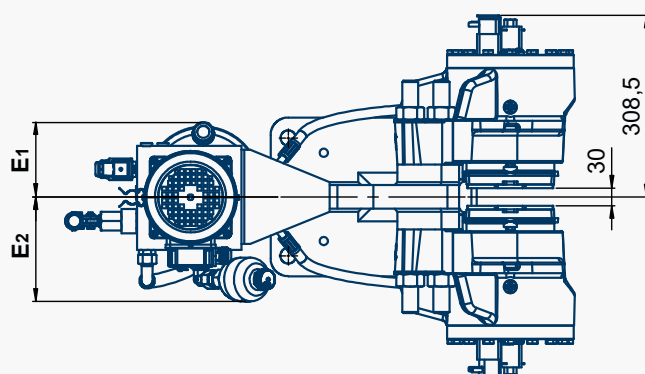
Revision date: 31.03.2025



SHV9A-		SHPU1	SHPU2
A	mm	~820	~815
B		~610	~690
C		~730	~695
E1		127	221
E2		178	168
F		D/2 + 20	
Weight	kg	247	256
Motor	kW	0.75	2.2

Can be associated with the electrical control units:
K-TB or **K-BA** or **K-PR** or **K-SI**

See technical data in SH9A leaflet



6 holes Ø26 for bolts M24 (class 8-8)
lubrication with MoS2
provided by the customer

Emergency Brakes

DISC BRAKE - SH15 CALIPER

Revision number: T03905-01-C

Revision date: 01.10.2021

Emergency brake
Fail safe
Spring application
Hydraulic release
Opening proving switches
Lining wear detector

Operating conditions:

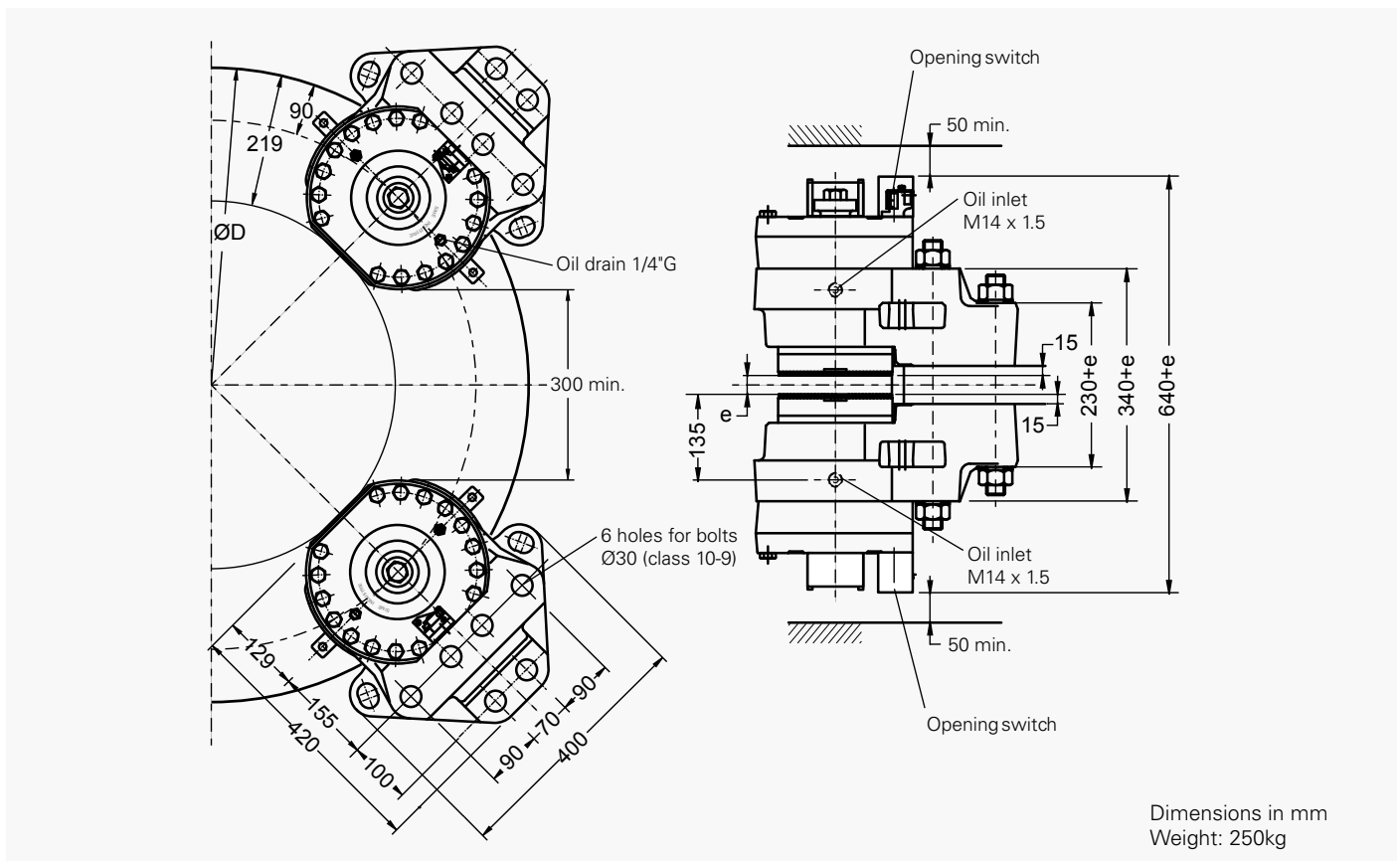
- Ambient temperature: -10°C to +60°C
- Relative humidity: ≤ 70%
- Dust in atmosphere ≥ 65μ
- Other conditions: consult us.

Use:

- The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains, Other use. consult us.

Options:

- Lining wear control switch
- Progressive braking system
- Marine protection
- Caliper on support with integral hydraulic power pack



Opening proving switch:

250VAC maxi., 5A maxi.,
with interrupting capacity: 50VA maxi.

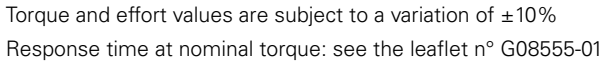
220VDC maxi., 5A maxi.,
with interrupting capacity: 50W maxi.

Compatible with PLC
(Programmable Logic Controllers).

An opening switch used with other equipment than PLC
must not be reused with a PLC.



Revision number: T03905-01-C Revision date: 01.10.2021



* **US2-1:** disc temperature during one braking $\leq 150^{\circ}\text{C}$
US2-4: disc temperature during one braking $\leq 600^{\circ}\text{C}$
US2-5: disc temperature during one braking $\leq 350^{\circ}\text{C}$, optional, consult us.

Emergency Brakes

DISC BRAKE - SH18B CALIPER

Revision number: T03907-01-C

Revision date: 22.11.2023

Emergency brake
Fail safe
Spring application
Hydraulic release
Opening proving switches
Lining wear detector

Operating conditions:

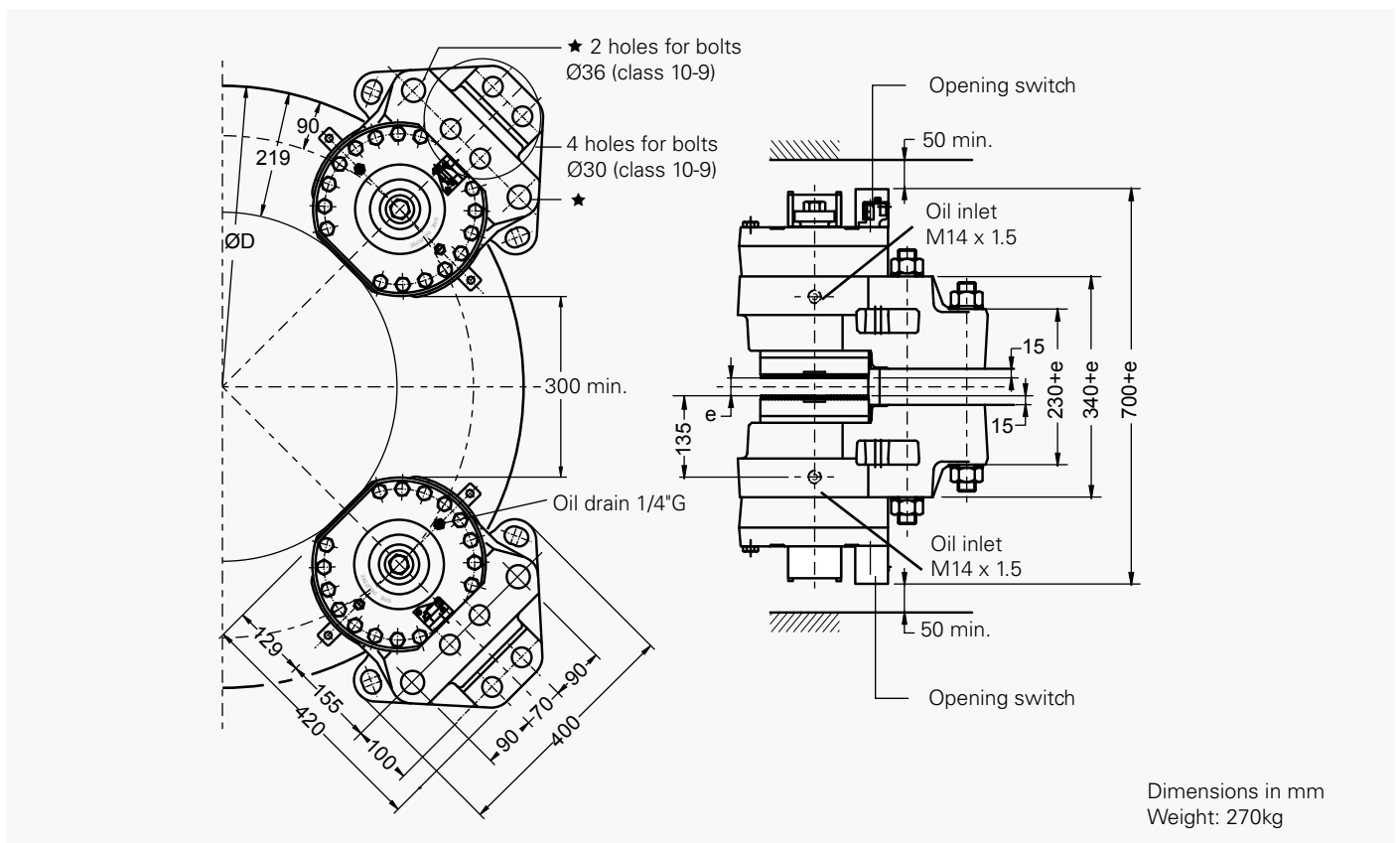
- Ambient temperature: -10°C to $+60^{\circ}\text{C}$
- Relative humidity: $\leq 70\%$
- Dust in atmosphere $\geq 65\mu$
- Other conditions: consult us.

Use:

- The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains. Other use, consult us.

Options:

- Lining wear control switch
- Progressive braking system
- Marine protection
- Caliper on support with integral hydraulic power pack



Opening proving switch:

250VAC maxi., 5A maxi.,
with interrupting capacity: 50VA maxi.

220VDC maxi., 5A maxi.,
with interrupting capacity: 50W maxi.

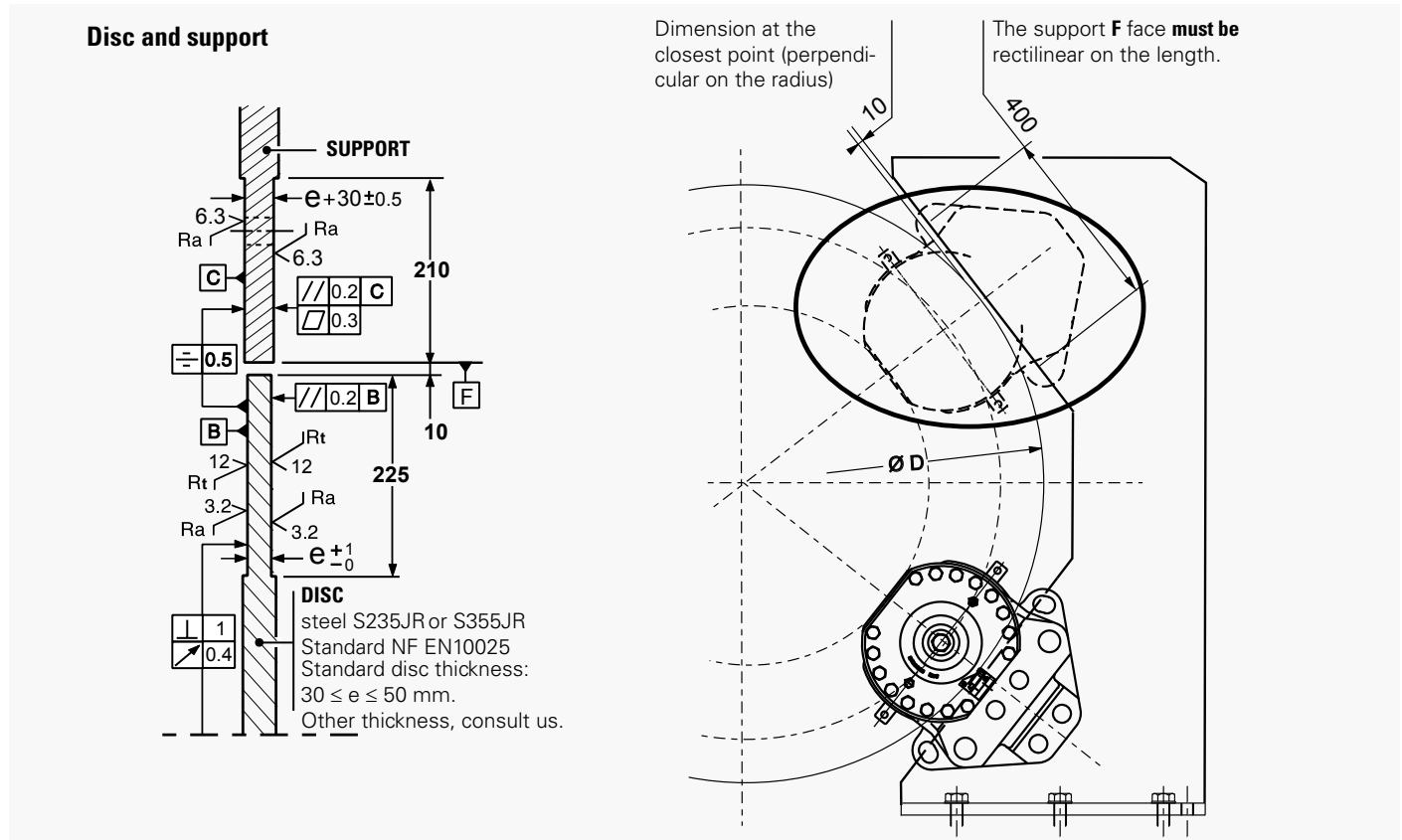
Compatible with PLC
(Programmable Logic Controllers).

An opening switch used with other equipment
than PLC must not be reused with a PLC.

DISC BRAKE - SH18B CALIPER

Revision number: T03907-01-C

Revision date: 22.11.2023



Torque and effort values are subject to a variation of ±10%
Response time at nominal torque: see the leaflet n° G08555-01

Designation	Caliper		SH18B		
	Lining *		US2-1	US2-5	US2-4
Braking force BF for 1 mm of air gap disc/ lining	Static	N	160 000	150 750	117 400
	Dynamic	N	180 000	167 500	130 500
Linear speed of the disc		m/s	≤ 10		≤ 50
Dynamic braking torque BT (N.m) for 1 caliper and disc ØD	1000 mm	N.m	73 800	68 680	53 500
	1200 mm	N.m	91 800	85 430	66 500
	1500 mm	N.m	118 800	110 550	86 100
	2000 mm	N.m	163 800	152 430	118 700
BT for other ØD (mm)		N.m	BT = BF (D/2000 - 0.09)		
Regulation pressure	minimum	bar	180		
	maximum	bar	200		
Setting pressure of limit valve of the hydraulic unit		bar	225		
Total volume of oil displaced		cm³	85 for one stroke disc/lining (nominal wear and opening)		

* **US2-1:** disc temperature during one braking ≤ 150°C

US2-4: disc temperature during one braking ≤ 600°C

US2-5: disc temperature during one braking ≤ 350°C, optional, consult us.

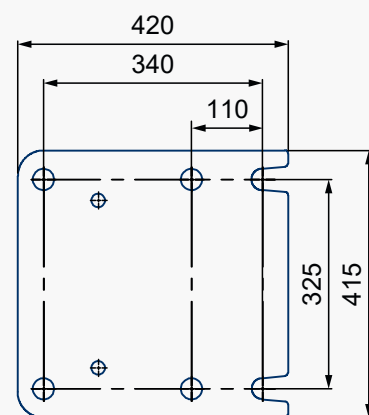
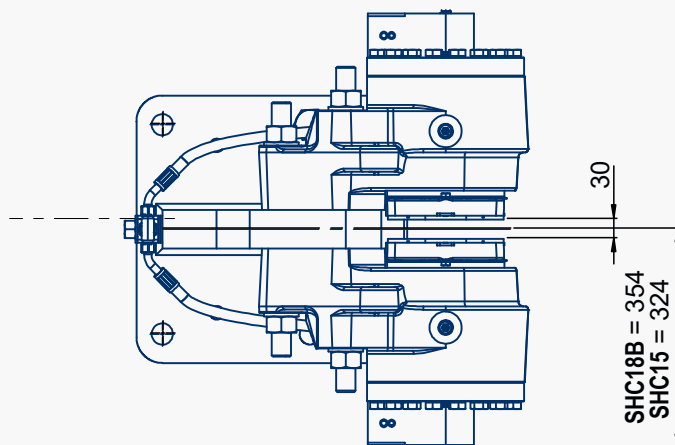
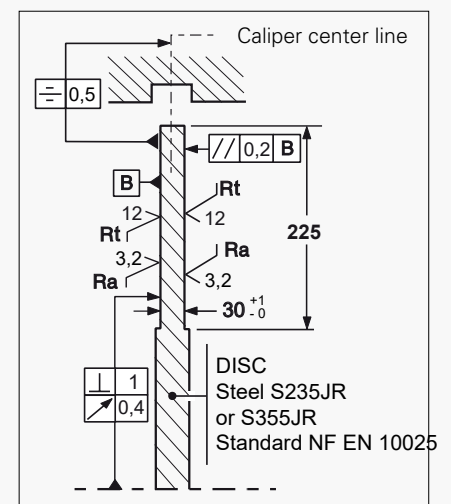
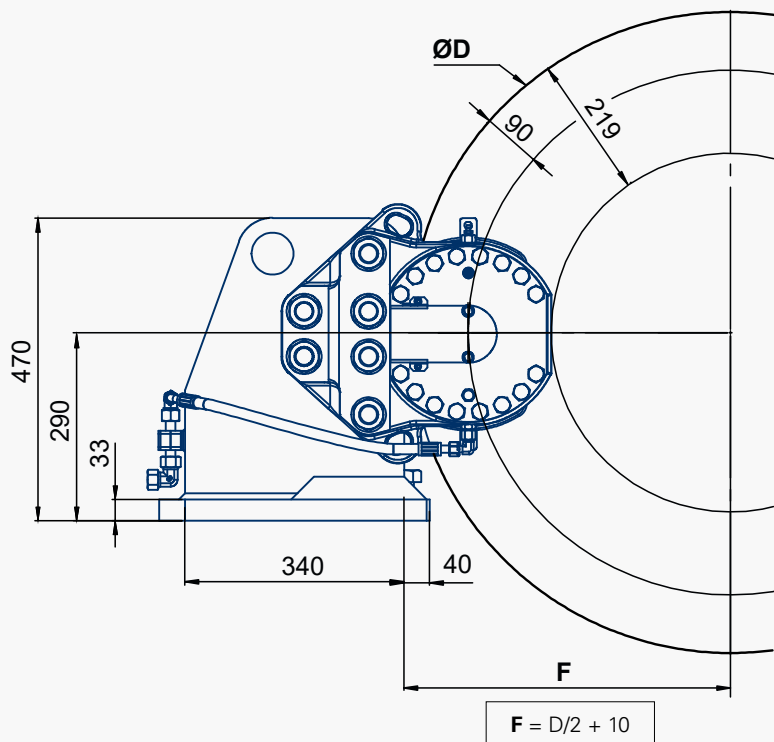
DISC BRAKE - SHV15, SHV18B CALIPERS

Revision number: T10193-01-D

Revision date: 30.01.2024



- Caliper mounted on a support
- Hydraulic connection for SHPU Hydraulic Power Pack
- Opening switches
- Lining wear indicator wires
- See technical data in SH15 and SH18B leaflets
- Weight = 357 kg

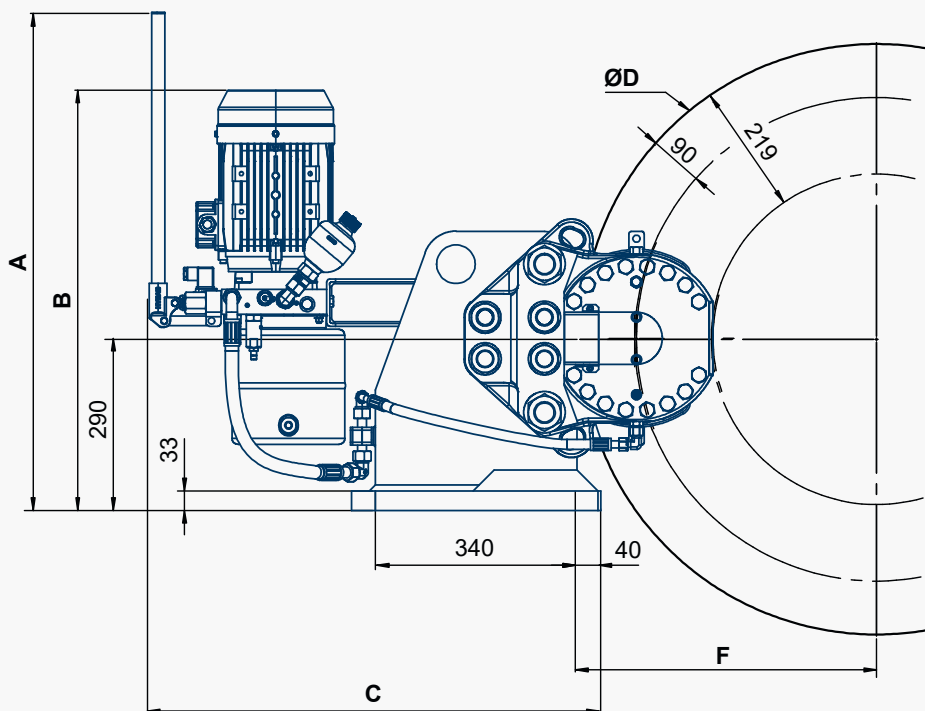
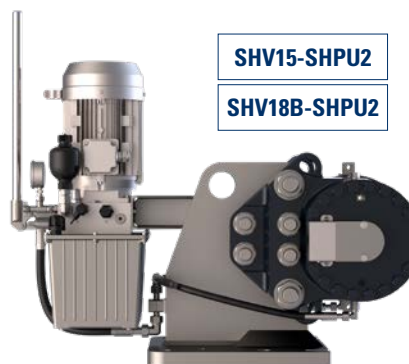
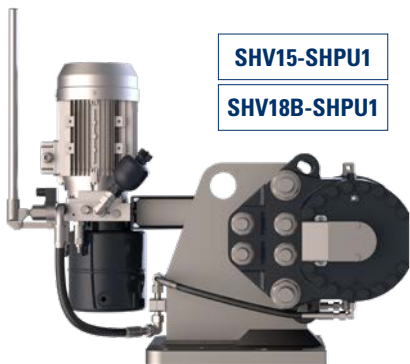


6 holes $\varnothing 33$ for bolts M30 (class 8-8)
lubrication with MoS2
provided by the customer

DISC BRAKE - SHV15-SHPU & SHV18B-SHPU CALIPERS

Revision number: T10193-01-D

Revision date: 30.01.2024

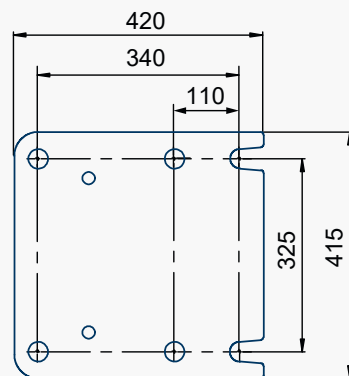
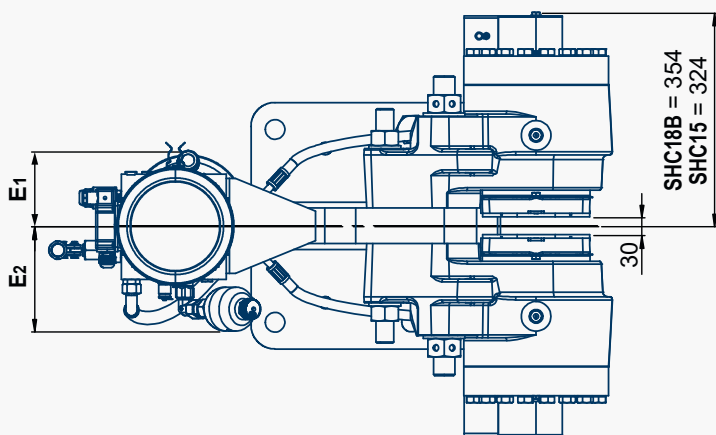


SHV15-SHV18B-		SHPU1	SHPU2
A	mm	~840	~835
B		~710	~710
C		~765	~756
E1		127	221
E2		178	192
F		D/2 + 10	
Weight	kg	397	406
Motor	kW	2.2	2.2

Can be associated with the electrical control units:

K-TB ou **K-BA** ou **K-PR** ou **K-SI**

See technical data in SH15 or
SH18B leaflet



6 holes Ø33 for bolts M30 (class 8-8)
lubrication with MoS2
provided by the customer

Emergency Brakes

DISC BRAKE - SH25 CALIPER

Revision number: T03915-01-C

Revision date: 22.11.2023

Emergency brake

Fail safe

Spring application

Hydraulic release

Opening proving switches

Lining wear detector

Operating conditions:

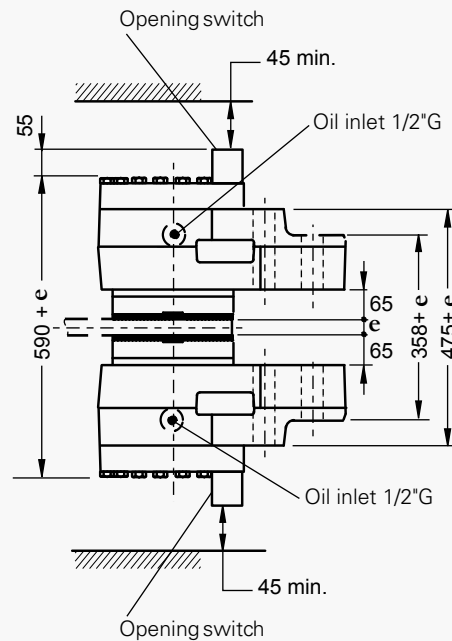
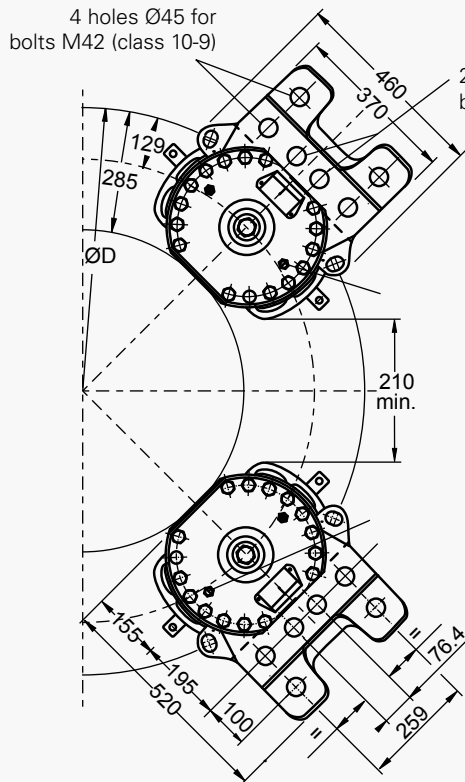
- Ambient temperature: -10°C to +60°C
- Relative humidity: $\leq 70\%$
- Dust in atmosphere $\geq 65\mu$
- Other conditions: consult us.

Use:

- The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains. Other use, consult us.

Options:

- Lining wear control switch
- Progressive braking system
- Marine protection
- Caliper on support with integral hydraulic power pack



Standard disc thickness:
 $30 \leq e \leq 50$ mm.
 Other thickness.
 consult us.

Dimensions in mm
 Weight: 440kg

Opening proving switch:

250VAC maxi., 5A maxi.,
 with interrupting capacity: 50VA maxi.

220VDC maxi., 5A maxi.,
 with interrupting capacity: 50W maxi.

Compatible with PLC
 (Programmable Logic
 Controllers).

An opening switch used with other equipment
 than PLC must not be reused with a PLC.

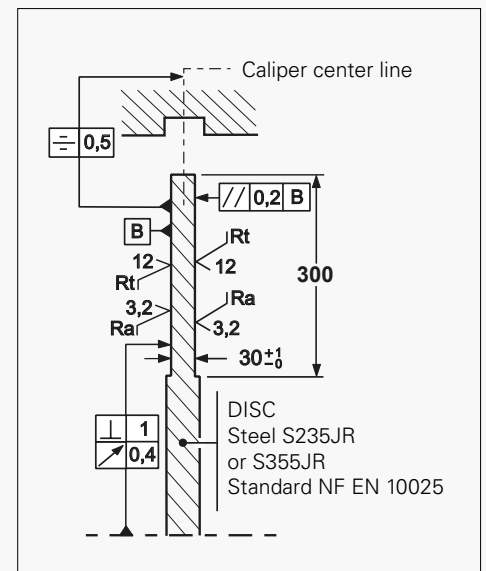
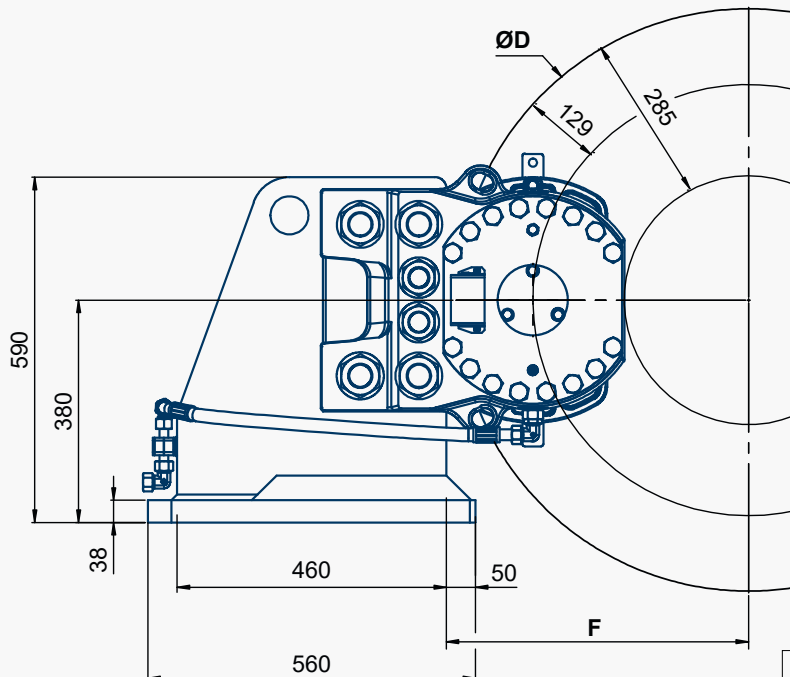
DISC BRAKE - SHV25 CALIPER

Revision number: T10194-01-B

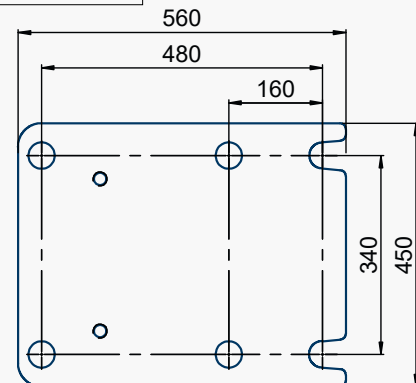
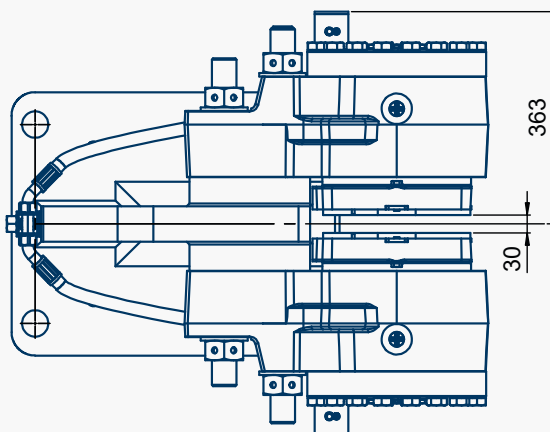
Revision date: 31.08.2023



- Caliper mounted on a support
- Hydraulic connection for SHPU Hydraulic Power Pack
- Opening switch
- Lining wear indicator wires
- See technical data in SH25 leaflet
- Weight = 691 kg



$$F = D/2 + 19$$

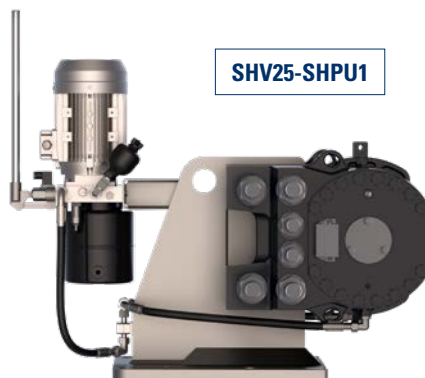


6 holes Ø45 for bolts M42 (class 8-8)
lubrication with MoS2
provided by the customer

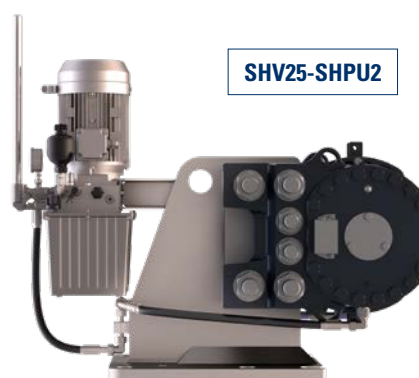
DISC BRAKE - SHV25-SHPU CALIPER

Revision number: T10194-01-B

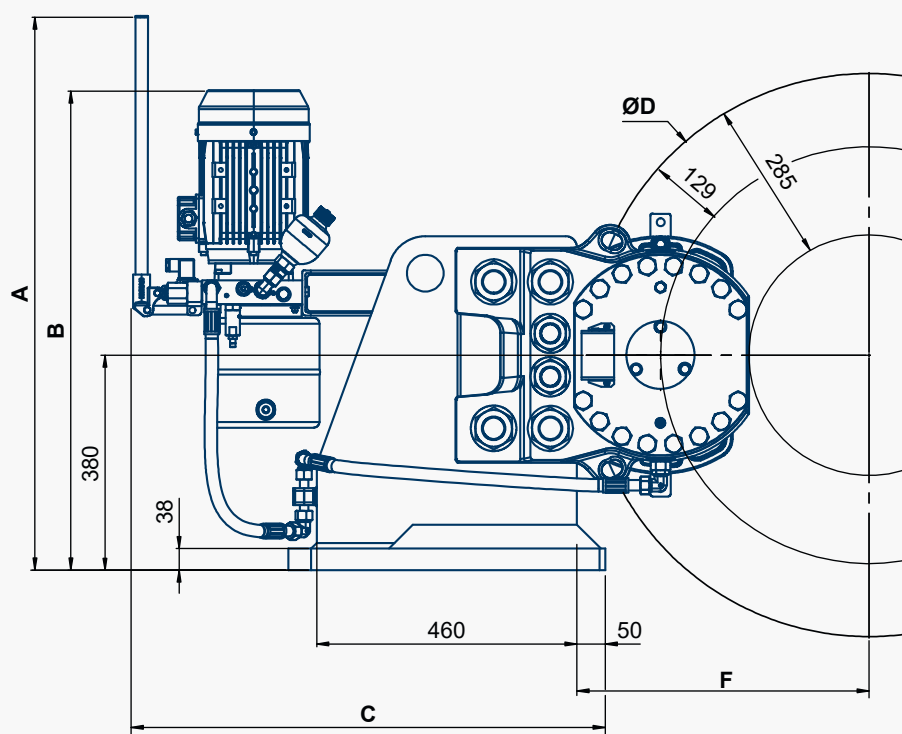
Revision date: 31.08.2023



SHV25-SHPU1



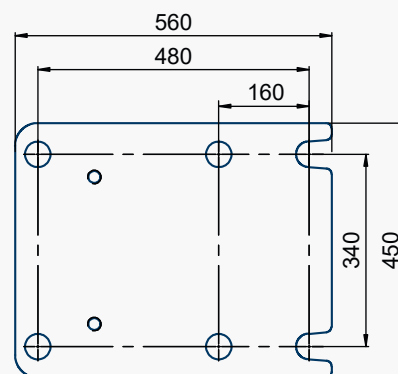
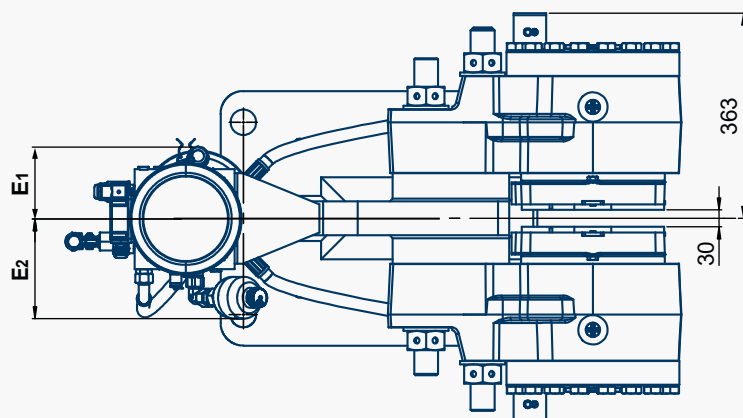
SHV25-SHPU2



SHV25-		SHPU1	SHPU2
A	mm	~980	~975
B		~845	~845
C		~840	~830
E1		127	221
E2		178	194
F	D/2 + 19		
Weight	kg	731	740
Motor	kW	2.2	2.2

Can be associated with the electrical control units:
K-TB or **K-BA** or **K-PR** or **K-SI**

See technical data in SH25 leaflet



6 holes Ø45 for bolts M42 (class 8-8)
lubrication with MoS2
provided by the customer

Emergency Brakes

DISC BRAKE - SH32 CALIPER

Revision number: T10040-01-D

Revision date: 22.03.2021

Emergency brake

Fail safe

Spring application

Hydraulic release

Opening proving switches

Lining wear indicator wires

Operating conditions:

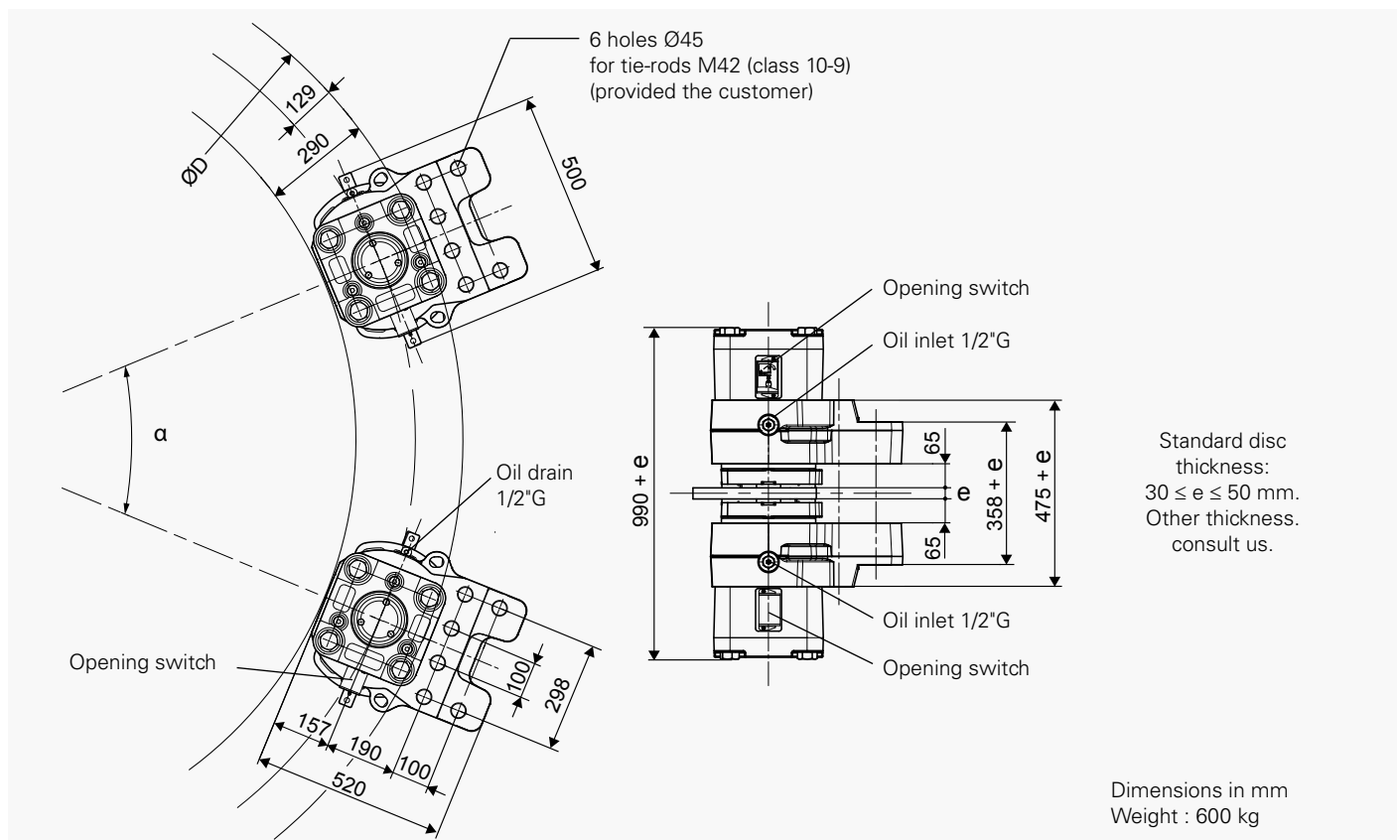
- Ambient temperature: -10°C to +60°C
 - Relative humidity: $\leq 70\%$
 - Dust in atmosphere $\geq 65\mu$
- Other conditions: consult us.

Use:

- The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains. Other use, consult us.

Options:

- Lining wear proving switches
- Progressive braking system
- Marine protection



Opening proving switches

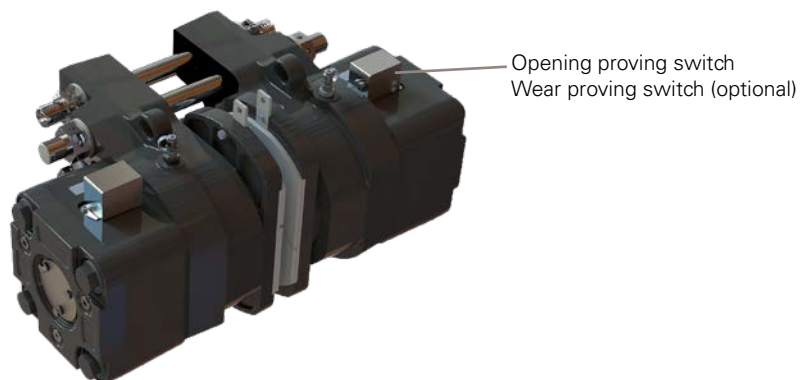
Wear proving switches (optional):

250VAC maxi., 5A maxi.,
with interrupting capacity: 50VA maxi.

220VDC maxi., 5A maxi.,
with interrupting capacity: 50W maxi.

Compatible with PLC (Programmable Logic Controllers).

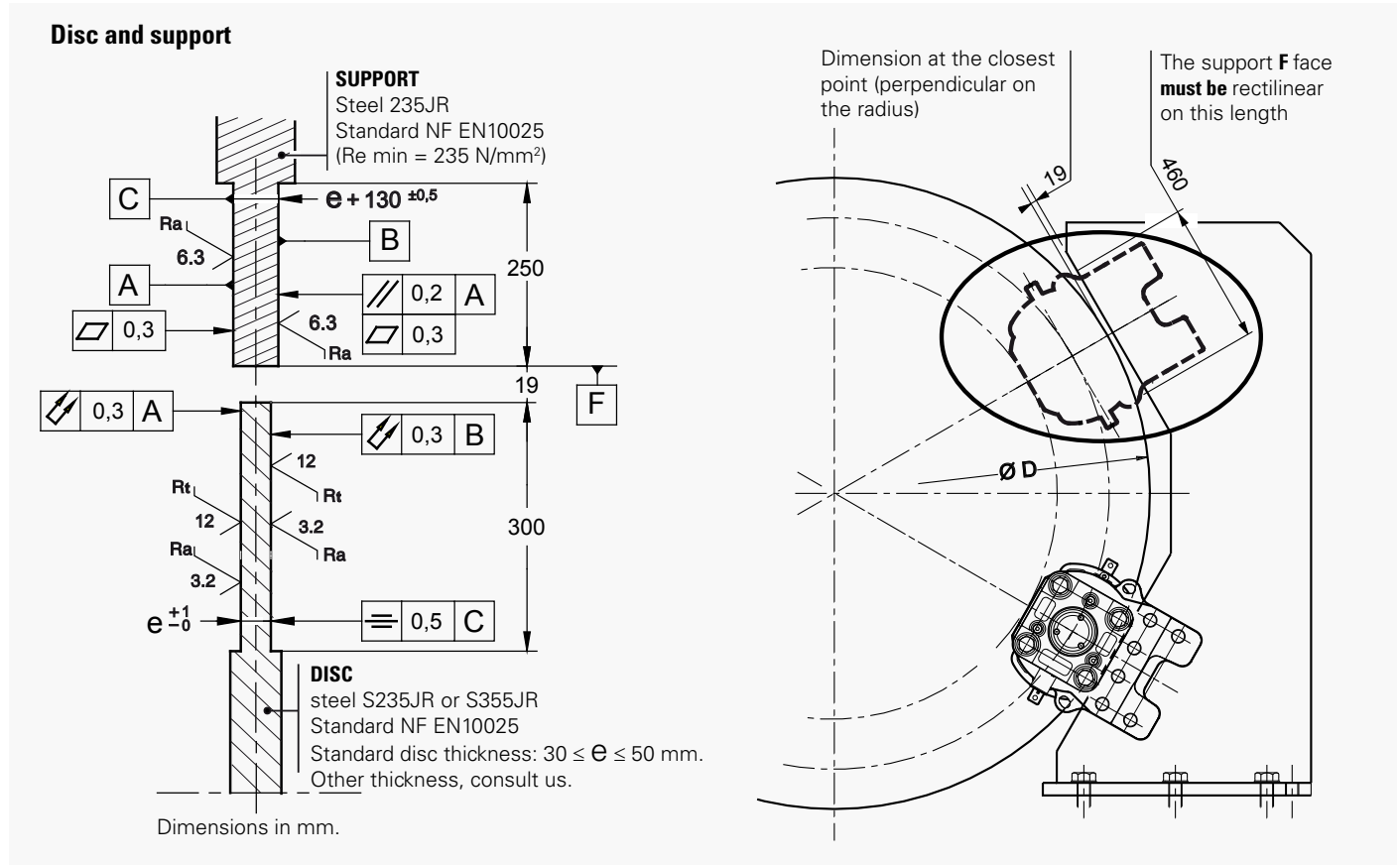
An opening switch used with other equipment than PLC must not be reused with a PLC.



DISC BRAKE - SH32 CALIPER

Revision number: T10040-01-D

Revision date: 22.03.2021



IMPORTANT

BRAKING FORCE and **TORQUE** values correspond to lining quality **US2-1** and disc steel S235JR or S355JR (standard NF EN10025), these values are subject to a variation of ±10%.

Response time at nominal torque ≤ 0.3s

Designation	Caliper		SH32
	Lining		US2-1
BRAKING FORCE BF for air gap disc/lining of 2 x 1.5 mm	Dynamic N Static N		333 800 300 000
BRAKING FORCE BF for air gap disc/lining of 2 x 2 mm	Dynamic N Static N		320 000 288 000
Linear speed of the disc	m/s		≤ 10
DYNAMIC BRAKING TORQUE BT for 1 caliper and disc ØD (mm)	N.m		BT = BF (D/2000 - 0.129)
Regulation pressure	minimum	bar	180
	maximum	bar	200
Setting pressure limit valve of hydraulic unit	bar		225
Total volume of oil displaced for air gap disc/lining of 2 x 2 mm	cm³		191 for one stroke disc/lining

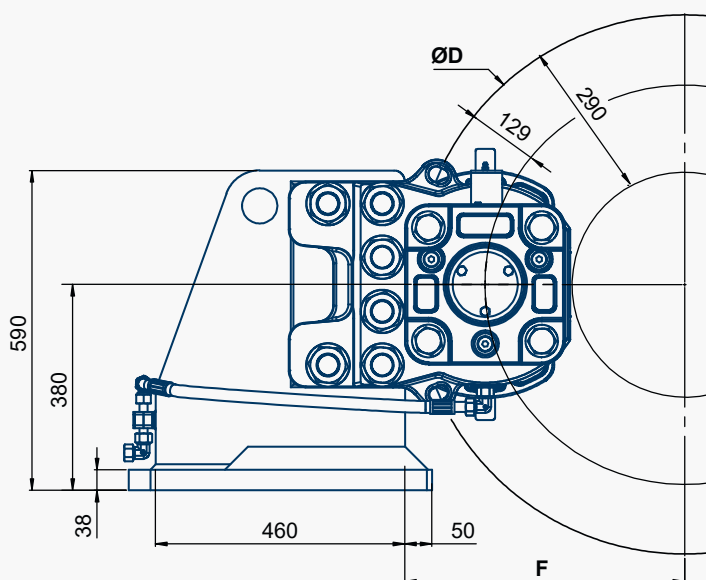
DISC BRAKE - SHV32 CALIPER

Revision number: T10195-01-B

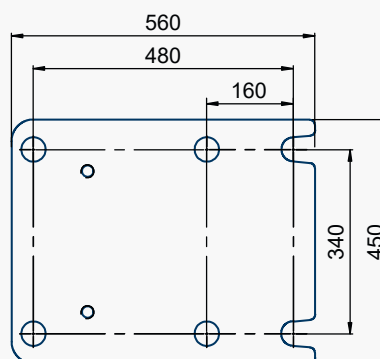
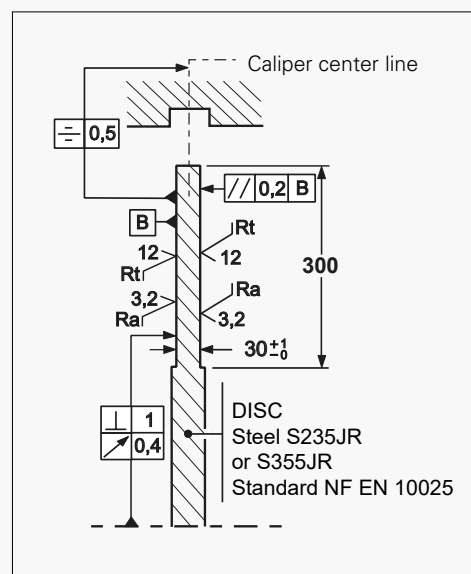
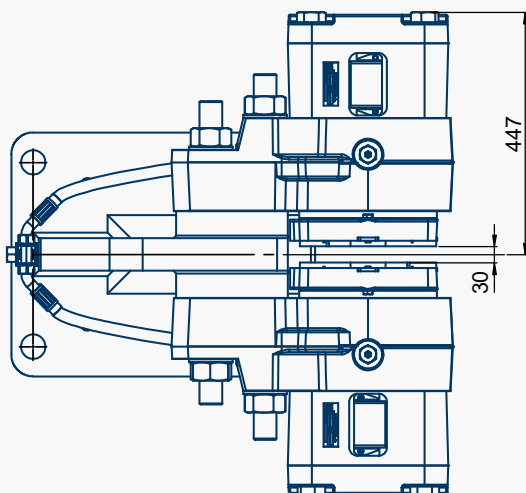
Revision date: 31.08.2023



- Caliper mounted on a support
- Hydraulic connection for SHPU Hydraulic Power Pack
- Opening switch
- Lining wear indicator wires
- See technical data in SH32 leaflet
- Weight = 851 kg



$$F = D/2 + 10$$

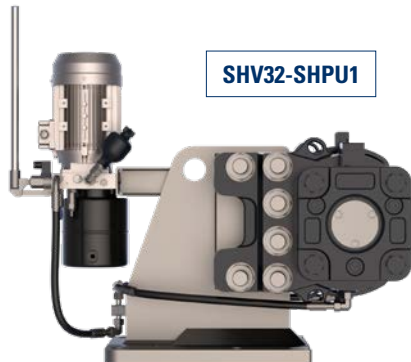


6 holes Ø45 for bolts M42 (class 8-8)
lubrication with MoS2
provided by the customer

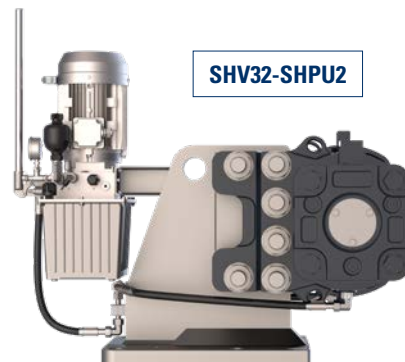
DISC BRAKE - SHV32-SHPU CALIPER

Revision number: T10195-01-B

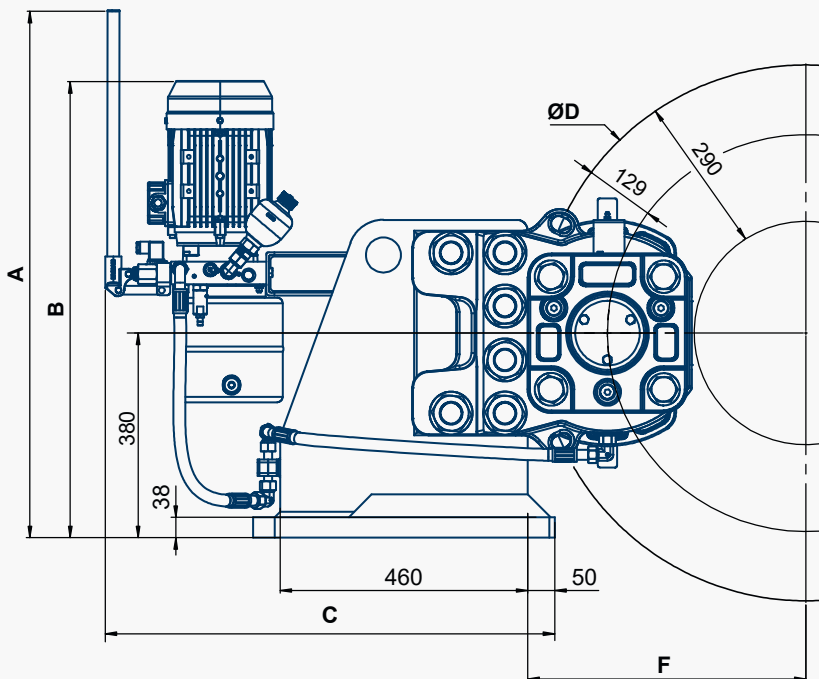
Revision date: 31.08.2023



SHV32-SHPU1



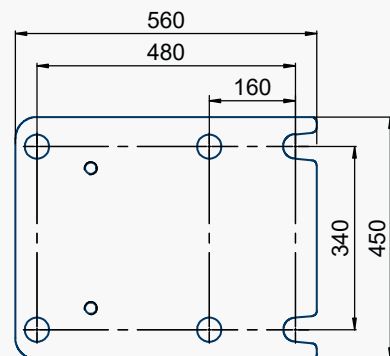
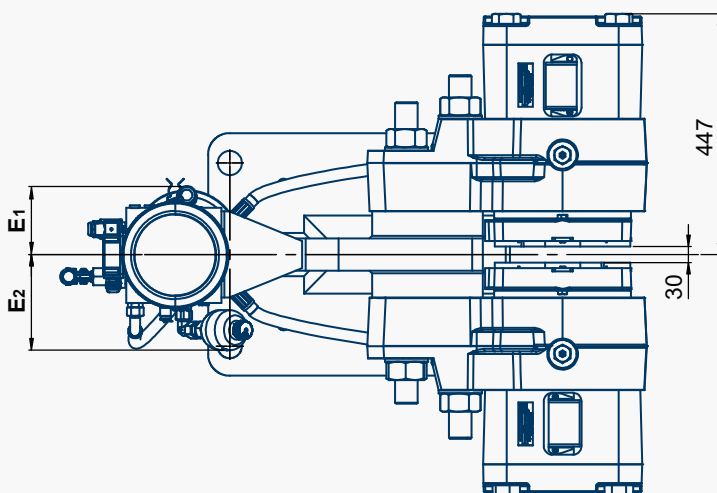
SHV32-SHPU2



SHV32-	SHPU1	SHPU2
A	mm	~980
B		~975
C		~845
E1		~845
E2		~835
F		~830
		127
		221
		178
		192
		D/2 + 10
Weight	kg	891
Motor	kW	2.2

Can be associated with the electrical control units:
K-TB or **K-BA** or **K-PR** or **K-SI**

See technical data in SH32 leaflet



6 holes Ø45 for bolts M42 (class 8-8)
lubrication with MoS2
provided by the customer

HYDRAULIC EMERGENCY BRAKES TYPES SHD / TH

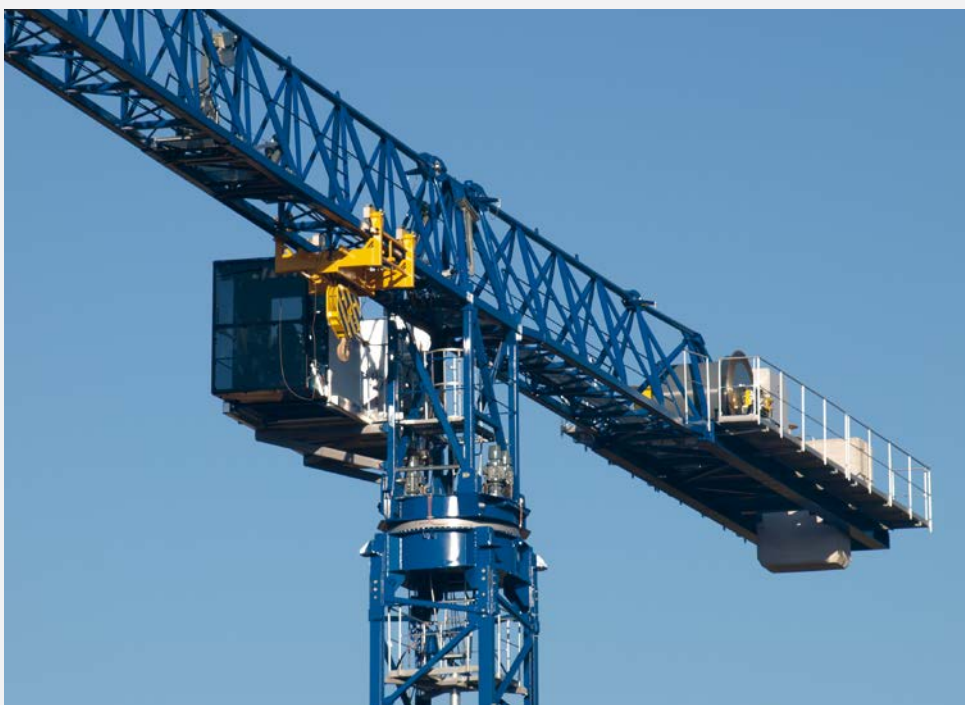
APPLICATIONS

SHD:

- TOWER CRANES - BOOM CRANES
- OFFSHORE APPLICATIONS
- WINDTURBINES

TH/THC9:

- AERONAUTIC APPLICATIONS
- PORT CRANES



MAIN CHARACTERISTICS	OPTIONS
- FAILSAFE BRAKE BY SPRING APPLICATION. - HYDRAULIC RELEASE - OPENING PROVING SWITCH - LINING WEAR INDICATORS	LINING WEAR PROVING SWITCH



SHD

- Single-spring hydraulical caliper
- A large range from SHD1 to SHD18
- Options:
 - Automatic lining wear compensation
 - Manual release tool - Positive braking
 - Integrated HPP - Marine protection



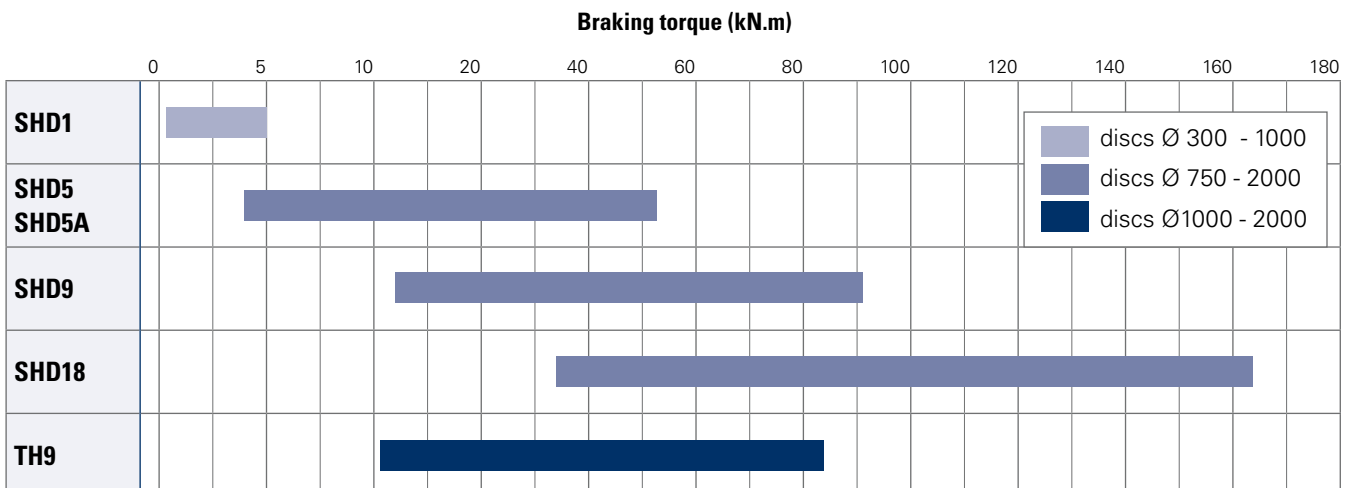
TH9

- Option:
 - Disc thickness 42 mm



THC9

- Caliper and Hydraulic Power Pack mounted on the same support
- Option: Electrical unit



Emergency Brakes

DISC BRAKE - SHD1 CALIPER

Revision number: T10098-01-G

Revision date: 16.09.2021

Emergency brake

Fail to safe

Spring application

Hydraulic release

Mechanical holding of the brake in open position for pads changing

Manual wear centering and compensation

Possible association with discs thickness: 12.7 (1/2"), 20 and 30mm.

Lining pads type **US2-1** or **ES3-7**

Lining pads with full wear indicators

Protection C5-M M

Operating conditions:

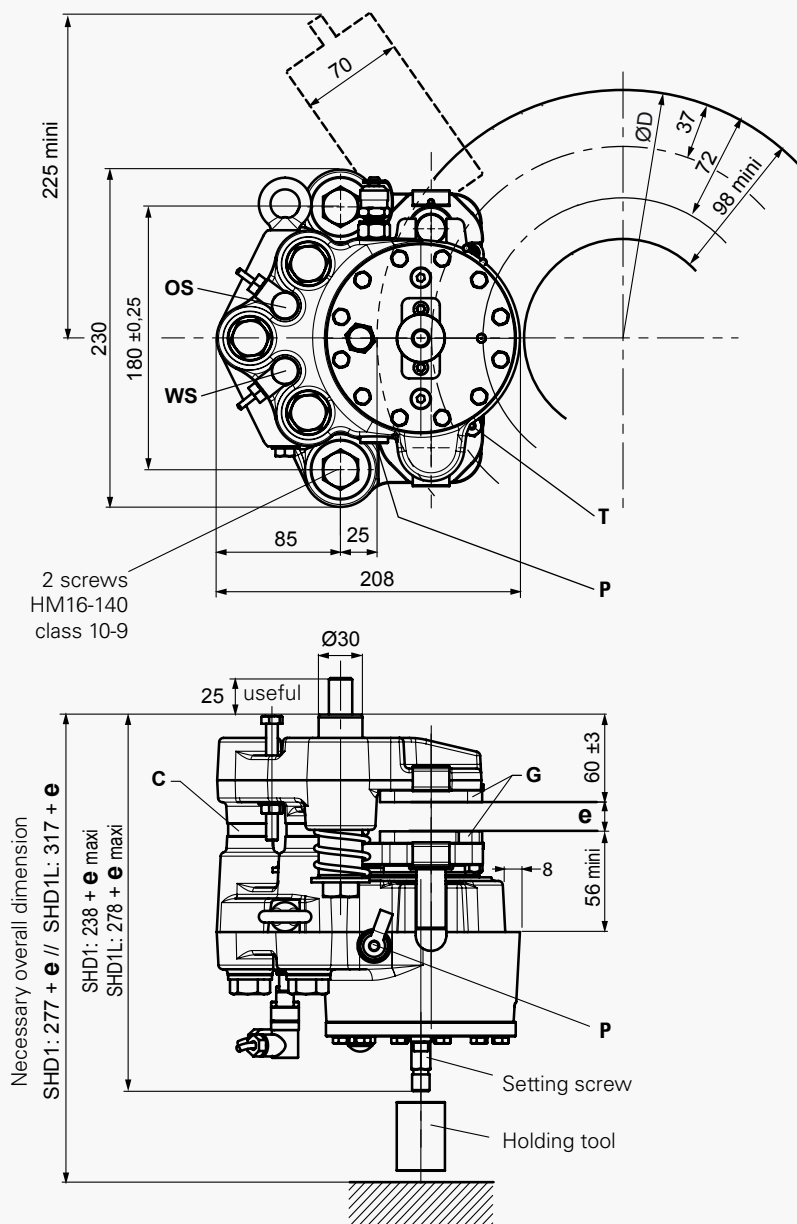
- Ambient temperature:
Dynamic braking: -30°C to +70°C
Brake applied (parking): -40°C to +70°C
- Relative humidity: ≤ 70%
- Dust in atmosphere ≥ 65µm
- Other conditions: consult us.

Use:

- The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains. Other use, consult us.

Options:

- Opening proving switch (**OS**)
- Lining wear proving switch (**WS**)
- All non-standard disc thickness > 12.7mm (1/2")
- Lining temperature sensor (**T**)
- Mechanical release tool (**DM**)
- SHD1L**: caliper with manual wear compensation at half wear:
 - braking force before wear = +10% maxi.
 - braking force at half wear = -10% maxi.



C = Spacers according to disc thickness
G = Linings: Thickness of new lining 8 mm
 Thickness to wear 6 mm
 Each 1 mm of wear on each side:
 manual centering and compensation
OS = Opening proving switch (option)
WS = Wear proving switch (option)
P = 2 oil ports 1/4"G
 Pressure tap delivered separately
T = PT100 sensor (option)
ØD: from 300 to 1000 mm
e = disc thickness

Dimensions in mm

Weight = 24 kg

Electrical data

Inductive switches of opening and wear (options):

3 wires PNP NO
 12 to 24 VDC 200mA
 with connector M12 / 5 positions
 according to standard:
 IEC61076-2-101 / code A

Sensor PT100 (option)

Detection of the temperature threshold:
 100°C ± 5

- R = 136.6 Ω at 95 °C
- R = 138.5 Ω at 100°C
- R = 140.4 Ω at 105°C

Cable length = 2.5 meters

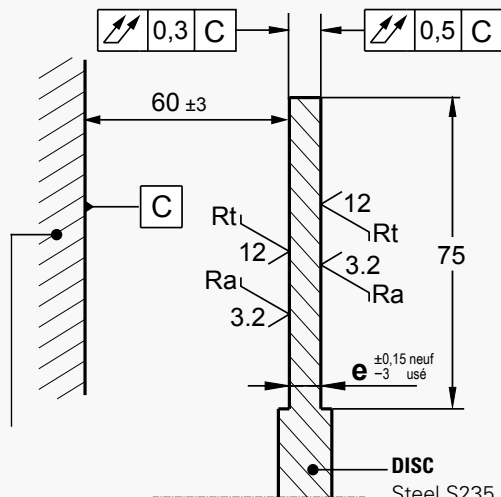
2 wires red/yellow

DISC BRAKE - SHD1 CALIPER

Revision number: T10098-01-G

Revision date: 16.09.2021

Installation instructions:

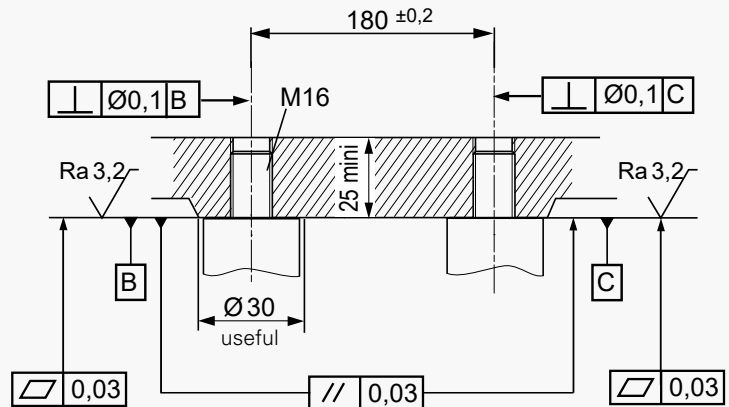


DISC

Steel S235JR or S355JR
Standard NF EN10025

Standard disc thickness:
 $e = 12.7$ (1/2"), 20 and 30 mm^{+0.15}₋₃
Other thickness, consult us.

Support machining tolerances:



Torque and effort values are subject to a variation of $\pm 10\%$
Closing time at nominal torque $\leq 0.3s$

Designation	Caliper SHD1-		5	4	3	2	1	5	4	3	2	1
	Lining *		ES3-7					US2-1				
Braking force BF for air gap disc/lining of 2x1mm	Dynamic	N	11 000	8 000	6 000	4 000	2 000	11 000	8 000	6 000	4 000	3 000
	Static	N	9 900	7 200	5 400	3 600	1 800	9 680	7 040	5 280	3 520	2 640
Linear speed of the disc ●		m/s	≤ 50					≤ 10				
Dynamic braking torque BT (m.N) for 1 caliper and disc ØD (mm) / 300 ≤ D ≤ 1000 mm		N.m	BT = BF (D/2000-0.037)									
Regulation pressure	Minimum	bar	150									
	Maximum	bar	170									
Setting pressure limit valve of hydraulic unit		bar	190									
Total volume of oil displaced for air gap disc/lining of:	2 x 1mm (nominal opening)		5 cm³									
	2 x 2mm (wear+opening)		cm³	9 cm³								
	2 x 4mm SHD1L (wear+open.)		cm³	18 cm³								

* ES3-7: disc temperature during one braking $\leq 600^\circ\text{C}$
US2-1: disc temperature during one braking $\leq 100^\circ\text{C}$

● For higher speed, consult us.

Emergency Brakes

DISC BRAKE - SHD5 CALIPER

Revision number: T03861-08-A

Revision date: 29.11.2010

Fail safe braking
Braking by spring application
Hydraulic release
Opening proving switch
Lining wear proving switch

Working conditions:

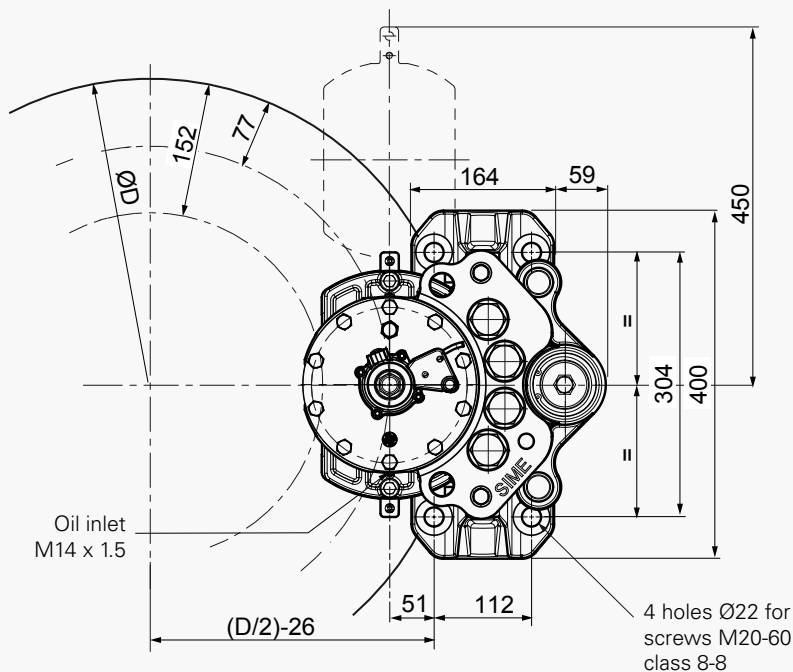
- Ambient temperature: -20°C to +60°C
- Relative humidity $\leq 70\%$
- Dust in atmosphere $\geq 65\mu$
- Other conditions, consult us.

Use:

- Emergency stopping brake in case of overspeed or loss of electrical supply

Options:

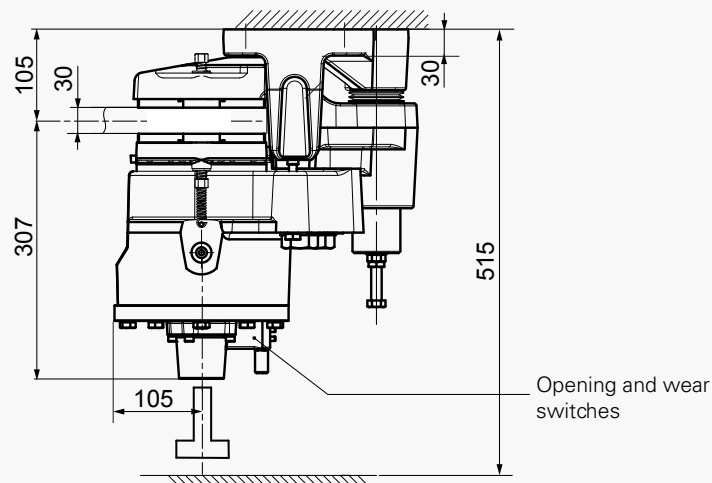
- Automatic lining wear compensation (WACS)
- Manual release tool (DM)
- Positive braking
- Detection of full lining wear
- Temperature detection of the linings
- Switch for PLC
- Marine protection



Opening and wear proving switches:

240V. 5A. 50VA AC
220V. 5A. 50W DC
2 m length cable (3 x 0.75 mm²)

Dimensions in mm
Weight: 105 kg



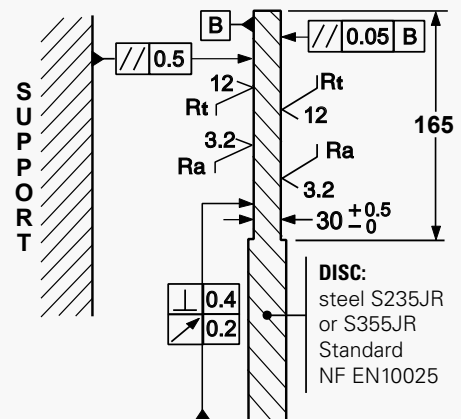
DISC BRAKE - SHD5 CALIPER

Revision number: T03861-08-A

Revision date: 29.11.2010



Installation instructions:



Torque and effort values are subject to a variation of $\pm 10\%$
Response time at nominal torque $\leq 0.3s$

Designation	Caliper		SHD5-6	SHD5-5	SHD5-4	SHD5-3	SHD5-2	SHD5-1
	Lining		WS1-3					
Braking force BF for 1.25 mm of air gap disc/lining	Dynamic	N	33 000	27 000	23 000	18 000	15 000	13 500
Linear speed of the disc for BF		m/s	< 50					
Dynamic braking torque BT (N.m) for a caliper mounted on a disc ØD (mm)	710 mm	N.m.	9 180	7 500	6 400	5 000	4 170	3 760
	1000 mm	N.m.	13 960	11 420	9 730	7 610	6 350	5 720
	1500 mm	N.m.	22 210	18 170	15 480	12 110	10 100	9 090
		N.m	BT = BF (D/2000 - 0.077)					
Regulation pressure	Min.	bar	110	110	85	60	60	60
	Max.	bar	140	140	115	80	80	80
Setting pressure limit valve hydraul. pack		bar	165	165	140	105	105	105
Total volume of oil displaced		cm ³	15.9 per stroke (for nominal disc/lining stroke of 1.25 mm per side)					
Max. oil volume of the jack		cm ³	76					

Emergency Brakes

DISC BRAKE - SHD5A-M2 CALIPER

Revision number: T10131-02-F

Revision date: 04.05.2023

Fail safe braking
Braking by spring application
Hydraulic release
Opening proximity switch
Holding tool
Detection of full lining wear
Protection level C3-H standard ISO 12944-2
VCI packing

Working conditions:

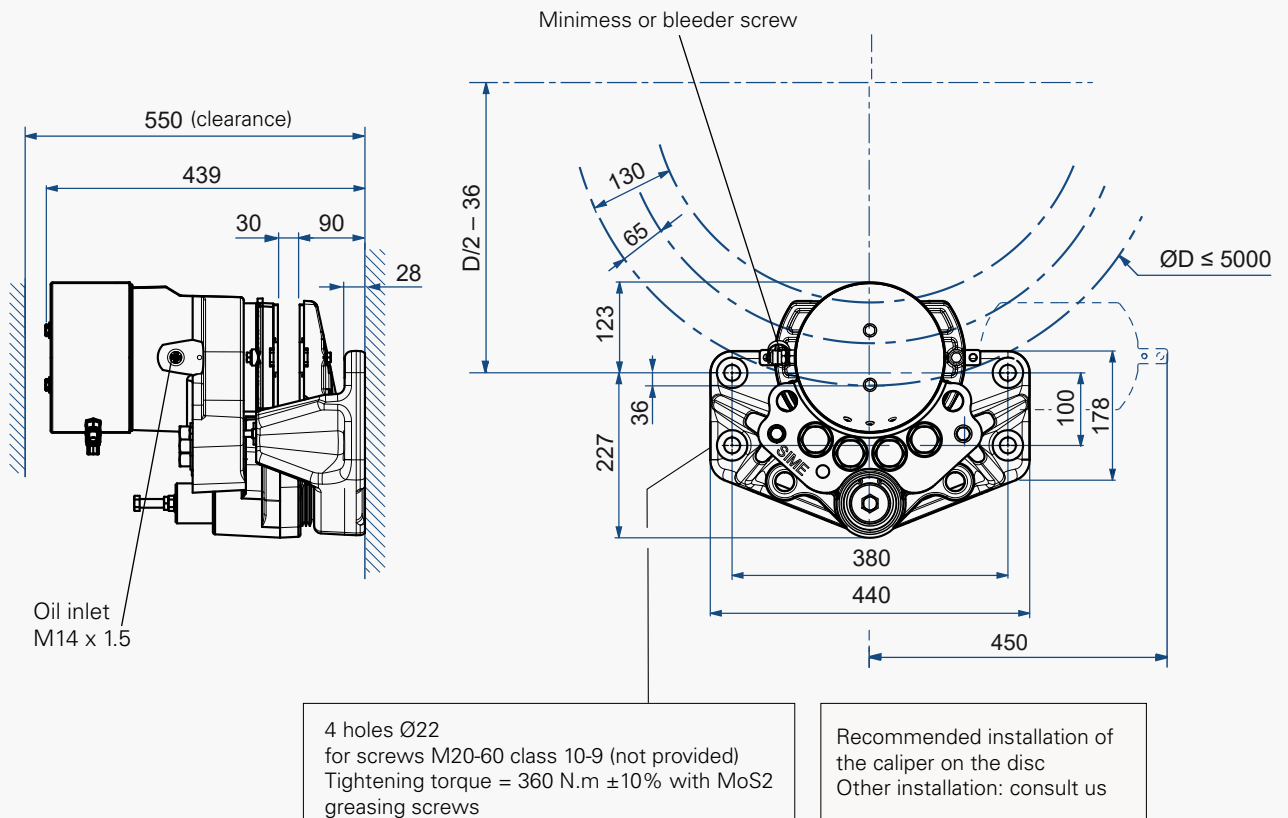
- Ambient temperature: -10°C to +60°C
- Relative humidity $\leq 70\%$
- Dust in atmosphere $\geq 65\mu$
- Other conditions. consult us.

Use:

- Emergency stopping brake in case of overspeed or loss of electrical supply
- Service life: 200 000 cycles

Options:

- Wear proximity switch
- Closing proximity switch
- Low temperature:
 - dynamic braking: -30°C to +60°C
 - brake closed (park position): -40°C to +60°C
- Protection level C5M-H



Electrical data:

Opening proximity switch:

3 wires PNP NO
10 to 58 VDC 200 mA
delivered with connector M12

Closing and wear switches: optional



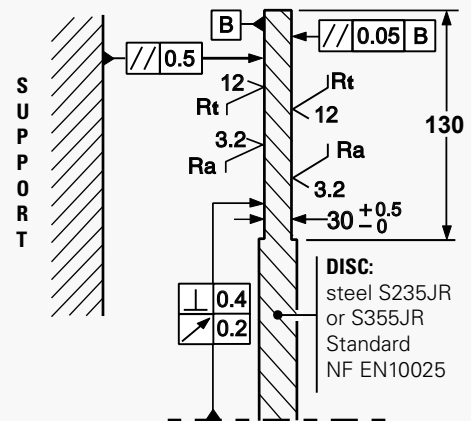
DISC BRAKE - SHD5A-M2 CALIPER

Revision number: T10131-02-F

Revision date: 04.05.2023



Installation instructions:



Torque and effort values are subject to a variation of $\pm 10\%$
Response time at nominal torque $\leq 0.3s$

Designation	Caliper SHD5A-...-M2		1	2	3	4	5	6	7	8
	Lining		US2-1							
Braking force BF for 1 mm of air gap disc/lining	Dynamic	N	15500	17700	20000	28000	33000	41000	48000	56000
	Static	N	13650	15600	17600	24650	29050	36100	42250	49300
Linear speed of the disc for BF		m/s	< 10							
Dynamic braking torque BT for a caliper mounted on a disc ØD (mm) Dmax.=1500 mm		N.m	BT = BF (D/2000 - 0.065)							
Regulation pressure	Min.	bar	60	60	85	85	110	140	140	180
	Max.	bar	80	80	115	115	140	160	160	200
Setting pressure limit valve hydraulic pack		bar	105	105	140	140	165	190	190	225
Total volume of oil displaced		cm ³	12.7 per stroke (for nominal disc/lining stroke of 1 mm per side)							
Max. oil volume of the jack		cm ³	76							

Emergency Brakes

DISC BRAKE - SHD9 CALIPER

Revision number: T10042-01-E

Revision date: 31.08.2017

Fail safe braking
Braking by spring application
Hydraulic release
Opening proximity switch for PLC
(induction sensor)
Lining wear detectors
Association with discs thickness 30 mm

Working conditions:

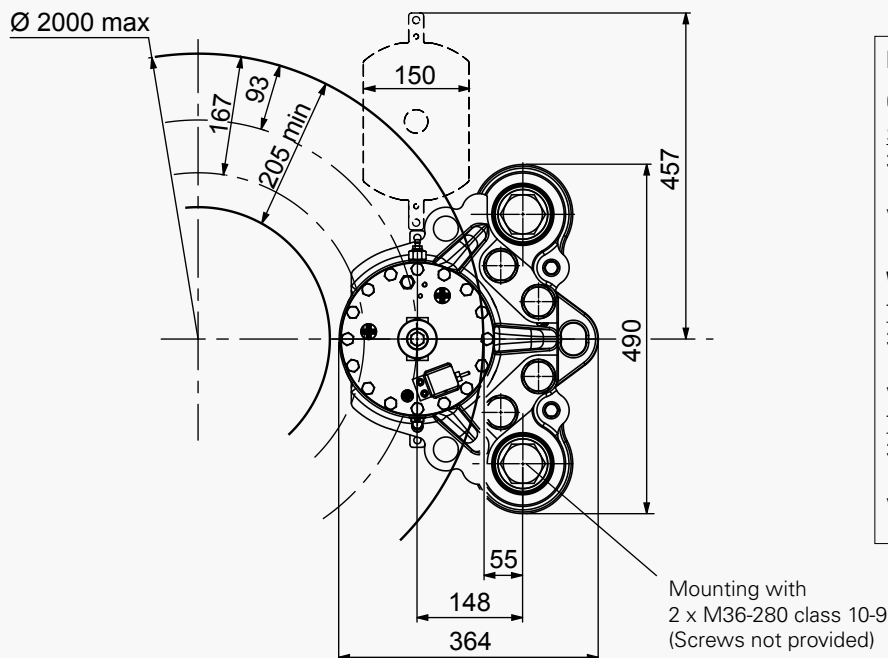
- Ambient temperature: -10°C to $+60^{\circ}\text{C}$
 - Relative humidity $\leq 70\%$
 - Dust in atmosphere $\geq 65\mu\text{m}$
- Other conditions, consult us.

Use:

- Emergency stopping brake in case of overspeed or loss of electrical supply

Option:

- Lining wear proximity switch
- Discs thickness $24 \leq e < 30$ mm.
- Option GF:
Ambient temperature:
- Dynamic braking: -30°C to $+60^{\circ}\text{C}$
- Parking braking: -40°C to $+60^{\circ}\text{C}$
- Marine protection



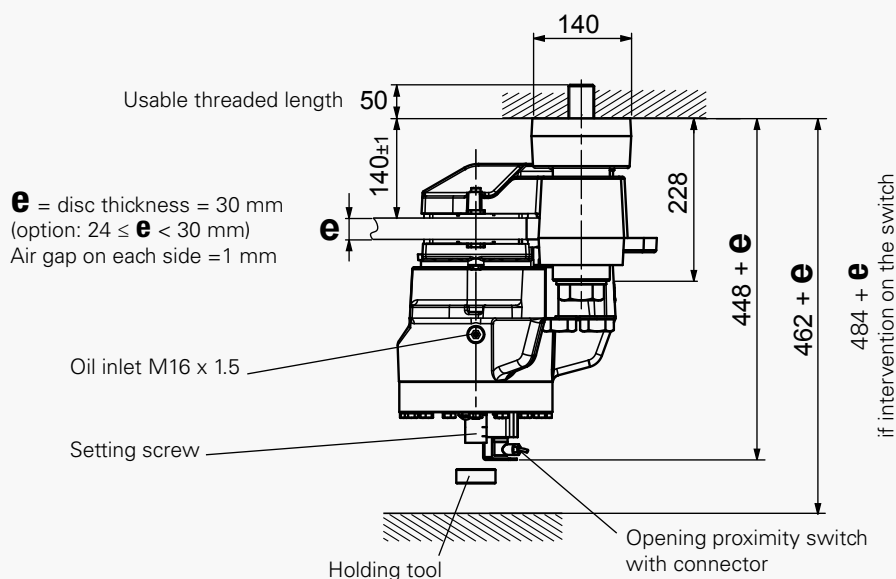
Electrical data:

Opening proximity switch

Standard caliper and caliper option GF
3 wires PNP NO
10 to 58 VDC 200 mA
with connector M12

Wear proximity switch (option):

Temperature -10°C to $+60^{\circ}\text{C}$
3 wires PNP NO
10 to 58 VDC 200 mA
with connector M12
Temperature -40°C to $+60^{\circ}\text{C}$ / Option GF
3 wires PNP NO
10 to 36 VDC 200 mA
with connector M12



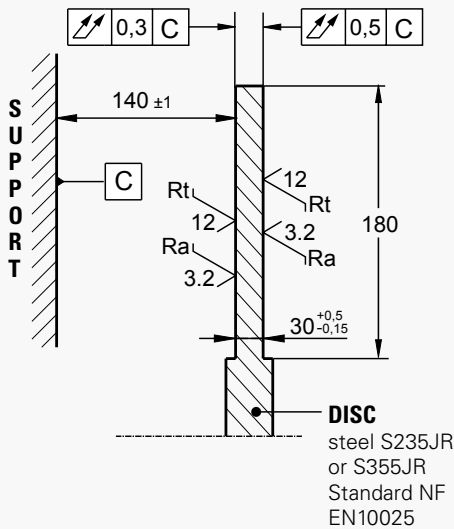
Weight: 148 kg
Dimensions in mm

DISC BRAKE - SHD9 CALIPER

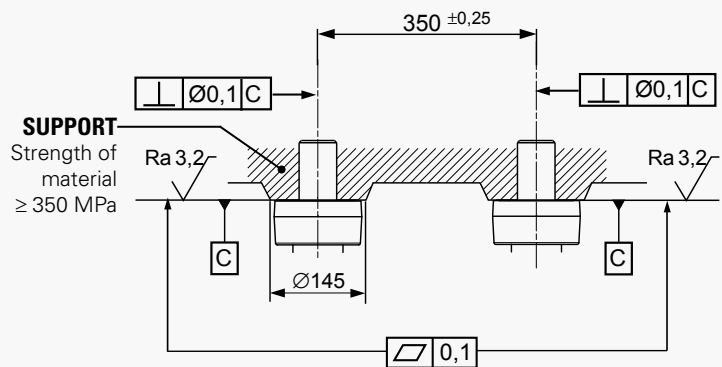
Revision number: T10042-01-E

Revision date: 31.08.2017

Installation instructions:



Support machining tolerances:



Torque and effort values are subject to a variation of $\pm 10\%$
Response time at nominal torque $\leq 0.3s$

Designation	Caliper		SHD9-6		SHD9-5		SHD9-4		SHD9-3		SHD9-2		SHD9-1	
	Lining *		US2-1	US2-5	US2-1	US2-5	US2-1	US2-5	US2-1	US2-5	US2-1	US2-5	US2-1	US2-5
Braking force BF for air gap disc/lining of 2x1mm	Dynamic	N	100 000	87 000	90 000	78 300	80 000	69 600	70 000	61 000	60 000	52 300	50 000	43 500
	Static	N	88 000	78 300	79 200	70 500	70 400	62 600	61 600	54 900	52 800	47 000	44 000	39 100
Linear speed of the disc	m/s		≤ 10											
Dynamic braking torque BT (m.N) for 1 caliper and disc ØD (mm) / D max ≤ 2000mm	N.m		BT = BF (D/2000 - 0.093)											
Regulation pressure	Minimum	bar	180		170		150		120		110		90	
	Maximum	bar	200		190		170		140		130		110	
Setting pressure limit valve of hydraulic pack	bar		220		210		190		160		160		130	
Total volume of oil displaced for air gap disc/lining of:														
2 x 1mm (nominal opening)	cm³		28											
2 x 1.5mm (nominal opening and wear before setting)	cm³		39											

* **US2-1**: disc temperature during one braking $\leq 150^\circ\text{C}$
US2-5: disc temperature during one braking $\leq 350^\circ\text{C}$.

Emergency Brakes

DISC BRAKE - SHD18 CALIPER

Revision number: T10129-01-B

Revision date: 29.06.2022

Fail safe braking

Braking by spring application

Hydraulic release

Opening and lining pre-wear detection device

Full lining wear indicators

Association with discs thickness 30 mm

Protection level C3 L standard NF ISO9223

Working conditions:

- Ambient temperature: -10°C to +60°C
- Relative humidity $\leq 70\%$
- Dust in atmosphere $\geq 70\mu\text{m}$
- Other conditions, consult us.

Use:

- Emergency stopping brake in case of overspeed or loss of electrical supply

Option:

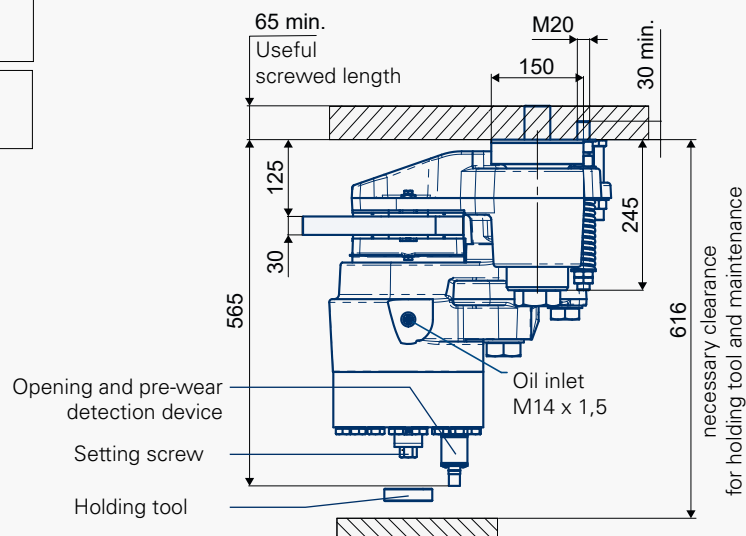
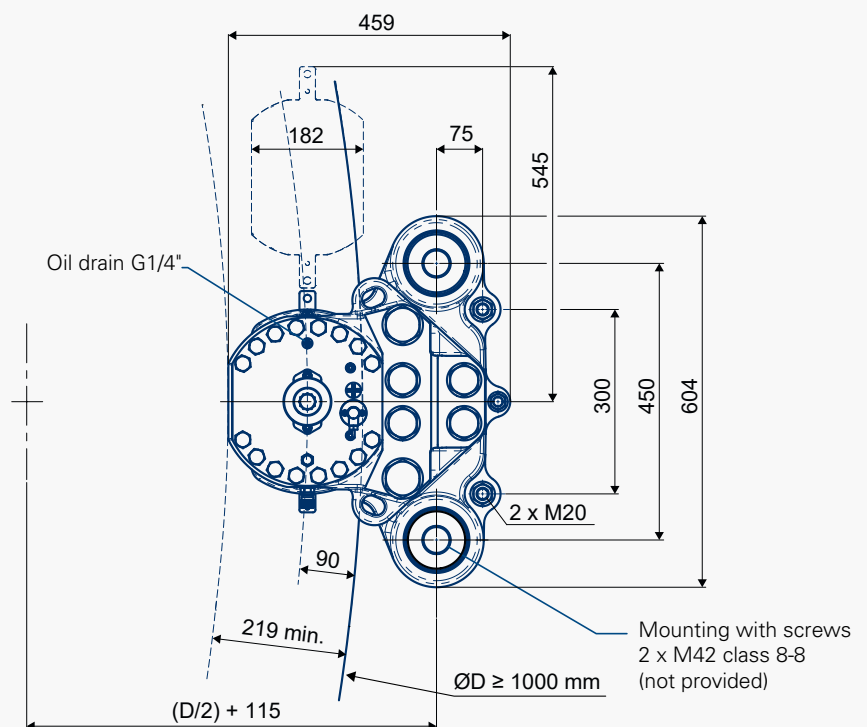
- Opening and wear inductive switches
- Protection level C5-M M standard NF ISO9223
- **SHDC18**: Caliper with Hydraulic Power Pack on the same support
- **SHDF18**: Floating caliper, consult us



Opening and pre-wear detection device:

Rated current: 0,1A to 6A
Nominal voltage: 80VDC to 250VAC
with connector M12 according to IEC61076-2-101 standard

Dimensions in mm
Weight: 306,5 kg

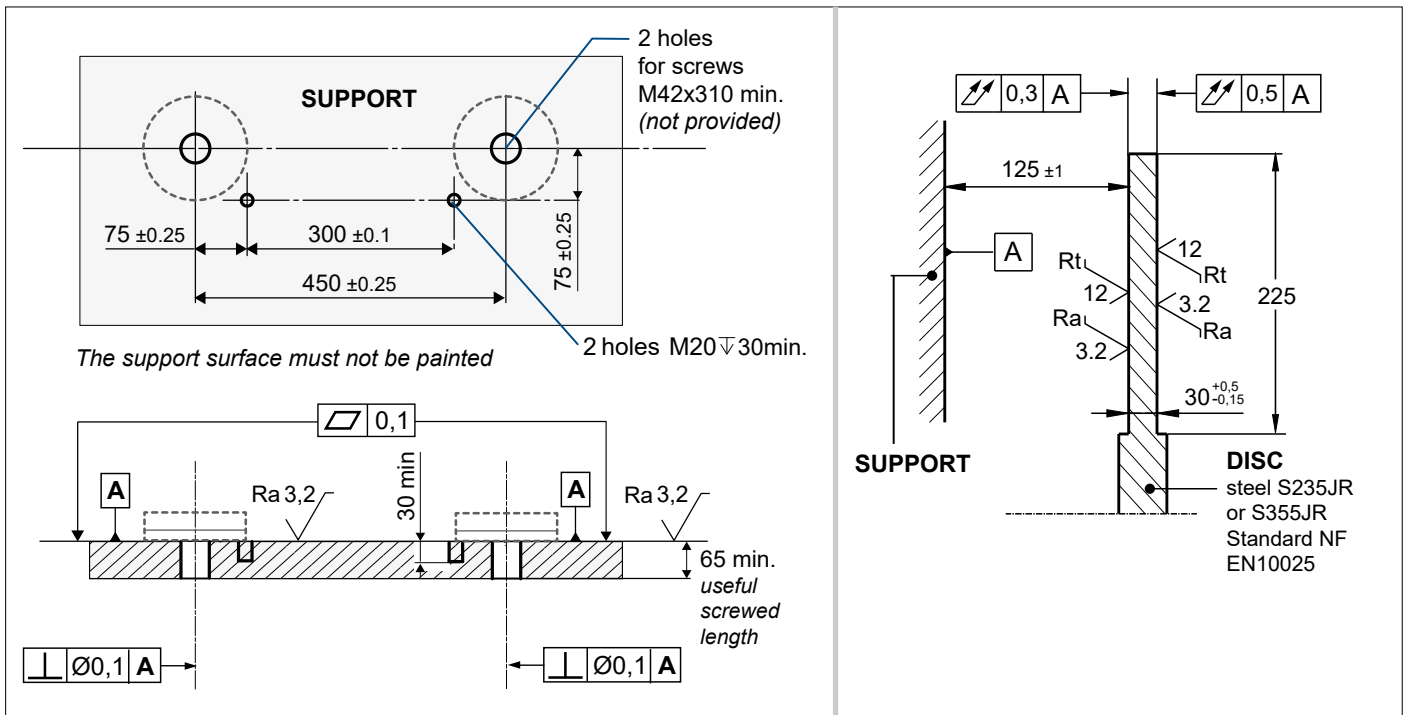


DISC BRAKE - SHD18 CALIPER

Revision number: T10129-01-B

Revision date: 29.06.2022

Installation instructions:



Torque and effort values are subject to a variation of $\pm 10\%$
Response time at nominal torque $\leq 0.3s$

Designation	Caliper		SHD18-3	SHD18-2	SHD18-1
	Lining		US2-1		
Braking force BF for air gap disc/ lining of 2x1mm	Dynamic	N	180 000	150 000	120 000
	Static	N	162 000	135 000	108 000
Linear speed of the disc		m/s	≤ 10		
Dynamic braking torque BT (m.N) for 1 caliper and disc ØD (mm) / 1000mm ≤ D ≤ 2000mm		N.m	BT = BF (D/2000 - 0,09)		
Regulation pressure	Minimum	bar	195	160	130
	Maximum	bar	205	170	140
Setting pressure limit valve of hydraulic unit		bar	225	190	160
Total volume of oil displaced for air gap disc/lining of:					
2 x 1 mm (nominal opening)		cm³	48		
2 x 2 mm (nominal opening + wear before setting)		cm³	82		

* US2-1: disc temperature during one braking $\leq 150^\circ C$

Emergency Brakes

DISC BRAKE - TH9 CALIPER

Revision number: T03830-01-C

Revision date: 13.12.2010

Fail safe

Spring applied
Hydraulic release (mineral oil)
Opening proving switch
Wear proving switch
Lining wear detector

Working:

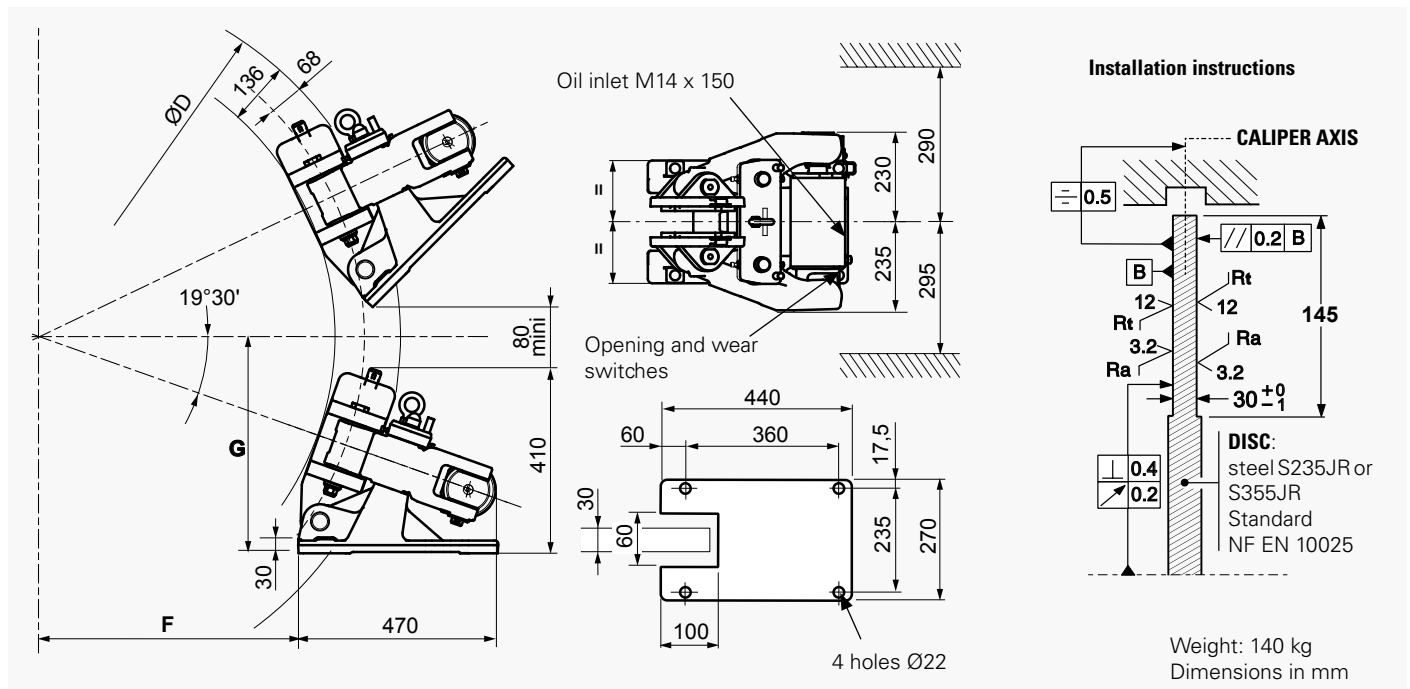
- Ambient temperature: -10°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65μ
- Other conditions, consult us.

Use:

Service brake to operate with full or variable torque
Emergency brake in case of overspeed or loss of electrical supply

Option:

Disc thickness 42 mm



Designation	Caliper		TH9-3		TH9-2		TH9-1	
	Lining *		US2-1	WS1-3	US2-1	WS1-3	US2-1	WS1-3
Braking force BF for 1mm of air gap disc/lining	Static	N	81 000	54 000	52 650	38970	28 350	22 140
	Dynamic	N	90 000	60 000	58 500	43 300	31 500	24 600
Linear speed of the disc		m/s	≤10	≤50	≤10	≤50	≤10	≤50
Dynamic braking torque BT (N.m) for 1 caliper and a disc ØD (mm)	1000 mm	Nm	38 880	25 920	25 270	18 700	13 600	10 620
	1200 mm	Nm	47 880	31 920	31 120	23 030	16 750	13 080
	1500 mm	Nm	61 380	40 920	39 890	29 530	21 480	16 770
	2000 mm	Nm	83 880	55 920	54 520	40 350	29 350	22 920
BT for other ØD (mm)		Nm	BT = BF (D/2000 - 0.068)					
Positioning when D<3000mm	F	mm	(0.4713 × D) - 172					
Above it. consult us	G	mm	(0.1669 × D) + 212					
Regulation pressure	minimum	bar	140	85	60			
	maximum	bar	160	115	80			
Setting pressure limit valve of hydr. unit		bar	190	140	105			
Total volume of oil displaced		cm³	58 for one stroke disc/lining (nominal wear and opening)					

* US2-1: disc temperature during one braking ≤ 150°C

WS1-3: disc temperature during one braking ≤ 600°C

US2-5: disc temperature during one braking ≤ 350°C, optional, consult us.

Torque and force values are subject to a variation of ±10%.

Response time at nominal torque : see the leaflet G08555-01.

Opening and wear switches:

250VAC maxi., 5A maxi., with interrupting capacity: 50VA maxi.

220VDC maxi., 5A maxi., with interrupting capacity: 50W maxi.

Compatible with PLC (Programmable Logic Controllers).
A switch used with other equipment than PLC must not be reused with a PLC.

DISC BRAKE - THC9B CALIPER

Revision number: T03836-01-C

Revision date: 24.08.2012

Fail safe
Spring application
Hydraulic release
Integral hydraulic power unit
Self contained electric system
Opening proving switch
Lining wear control switch
Lining wear detector

Operating conditions:

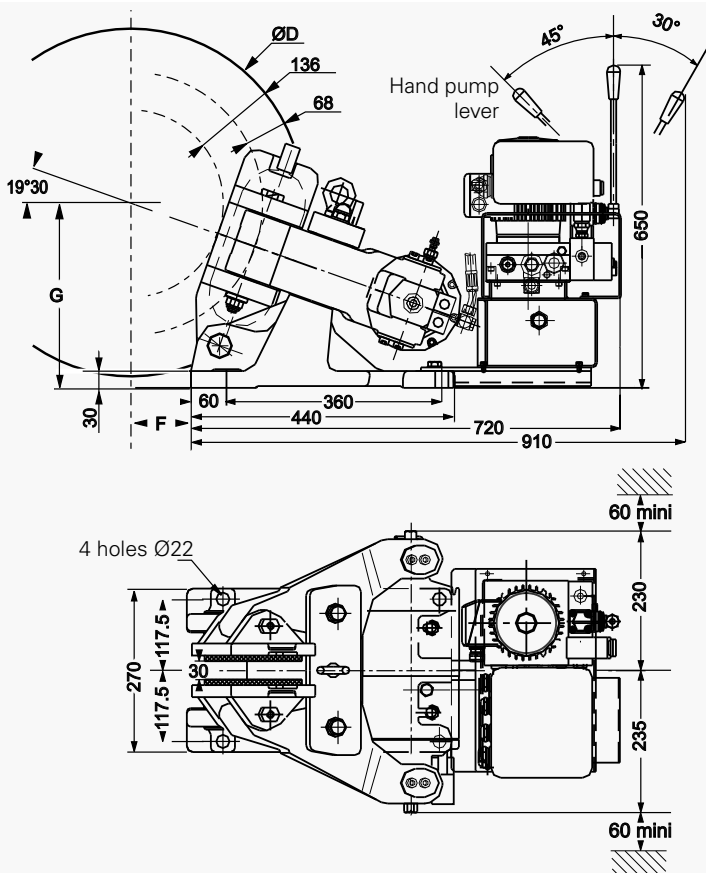
- Ambient temperature: -10°C to +60°C
 - Relative humidity: ≤ 70%
 - Dust in atmosphere ≥ 65µ
- Other conditions, please contact us.

Use:

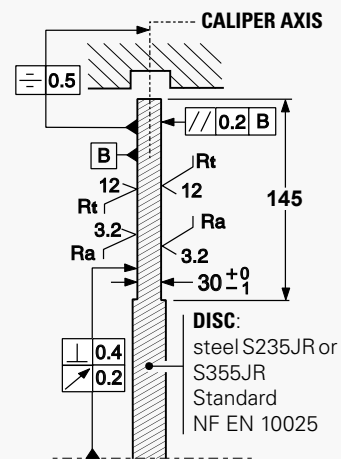
The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains. Other use, please contact us.

Options:

- Progressive braking system
- Disc thickness 42 mm



Installation instructions



Permissible inclination of the caliper:
±15° maximum regarding the horizontal.
For other mounting, please contact us.

Weight: 180 kg
Dimensions in mm

Designation	Caliper		TH9-3		TH9-2		TH9-1	
	Lining *		US2-1	WS1-3	US2-1	WS1-3	US2-1	WS1-3
Braking force BF for 1mm of air gap disc/lining	Static	N	81 000	54 000	52 650	38 970	28 350	22 140
	Dynamic	N	90 000	60 000	58 500	43 300	31 500	24 600
Linear speed of the disc		m/s	≤10	≤50	≤10	≤50	≤10	≤50
Dynamic braking torque BT (N.m) for 1 caliper and a disc ØD (mm)	1000 mm	Nm	38 880	25 920	25 270	18 700	13 600	10 620
	1200 mm	Nm	47 880	31 920	31 120	23 030	16 750	13 080
	1500 mm	Nm	61 380	40 920	39 890	29 530	21 480	16 770
	2000 mm	Nm	83 880	55 920	54 520	40 350	29 350	22 920
BT for other ØD (mm)		Nm	BT = BF (D/2000 - 0.068)					
Positioning when D<3000mm Above it. consult us	F	mm	(0.4713 × D) - 172					
	G	mm	(0.1669 × D) + 212					
Setting pressure limit valve of hydr. pack	bar		190	140	105			

* **US2-1:** disc temperature during one braking ≤ 150°C

WS1-3: disc temperature during one braking ≤ 600°C

US2-5: disc temperature during one braking ≤ 350°C, optional, consult us.

Electrical data:

HPP motor: 3 phases: 230/400V ±10%
50Hz 0.37kW, 4 poles
for mains: 230/400 V 50 Hz
or 415 V 50 Hz or 460 V 60 Hz

Motor option: 400/690V ±10% 50Hz
255/440V ±10% 50Hz
290/500V ±10% 50Hz
280/480V ±10% 60Hz
330/575V ±10% 60Hz

Other voltage, please contact us.
Electrical casing IP55

Opening and wear proving switches:

U mini 24V AC or DC
U maxi 250V AC ou 220 V DC
I mini 0.1A AC or DC
I maxi 5A AC or DC
interrupting capacity:
mini: 2.4VA AC or 2.4W DC
maxi: 50VA (AC) ou 50W (DC)

HYDRAULIC POWER UNITS





SHPU1 · 0.75kW · Mano · K-TB



SHPU2 · 2.2kW



SHPU3 · MOPS · K-PR



SHPU4 · K-TB2

HPU	SHPU1			SHPU2				SHPU3		SHPU3 MOPS or SB		SHPU4
Tank	5L (useful 4.5L)			8L (6L)		11L (7.5L)		35L (30L)		8L (6L)		80L (60L)
Motor (kW)	0.37	0.75	2.2	0.75	2.2	0.75	2.2	0.75	2.2	0.75	2.2	2.2
Weight (kg)	24 to 40 *			36 to 49 *		39 to 52 *		85 to 110 *		46 to 60 *		460 *

* CALIPERS	SH1	1 > 7	8 > 12		1 > 12		1 > 12		1 > 12	13 > 50	1 > 12		13 > 50
	SHD1	1 > 6	7 > 14		1 > 14		1 > 14		1 > 12	13 > 60	1 > 12	13 > 16	13 > 60
	SH5	1	2 > 4	5		1 > 5		6 > 9		1 > 30		1 > 5	1 > 30
	SHD5A	1	2 > 4	5 > 7		1 > 6		7 > 10		1 > 39		1 > 6	1 > 39
	SH9A		1 > 2	3		1 > 3		4 > 5		1 > 17		1 > 3	1 > 17
	SHD9		1 > 2	3		1 > 3		4 > 5		1 > 19		1 > 3	1 > 19
	TH9		1 > 2			1 > 2		3 > 4		1 > 16			1 > 16
	SHM10		1		1		1 > 2		1 > 9				
	SH15-SH18B			1 > 2				1 > 3		1 > 10		1 > 2	1 > 10
	SH25			1				1 > 2		1 > 6		1	1 > 6
	SH32			1				1		1 > 5		1	1 > 5

OPTIONS	CPS •	x	x	x	x	x	x	x	x	x	x	x	x
	Mano	x	x	x	std	std	std	std	std	std	std	std	std
	MS	x	x	x	x	x	x	x	x	x	x	x	x
	OP1	x	x	x	x	x	x	x	x	x			std
	OP1-OP2 or OP3				x	x	x	x	x	x			std
	Y5				x	x	x	x	x	x			x
	Y1-3				x	x	x	x	x	x			x
	OP5E				x	x	x	x	x	x	x	x	std
	OP6	x	x	x	x	x	x	x	x	x	x	x	std
	OP7-8				x	x	x	x	x	x	x	x	std
	OP10				x	x	x	x	x	x	x	x	x
	SOFT BRAKING **								x	x	std	std	x
	MOPS **								x	x	std	std	
	ACC+ **								x	x			std
	Oil heater						x	x	x	x			

* SHPU1/2 and 3: with oil and without electrical unit / SHPU4: with oil, electrical unit K-TB2 and OP10.

• With K-SI electrical unit, the pressure switch (CP or CPS) is replaced by a pressure sensor, consult us.

* For the opening times of the associated calipers, consult us.

** This option requires adjustments inherent to the installation. It is imperative to consult us.

Hydraulic Power Units

HYDRAULIC POWER UNITS - SHPU1

Revision number: T010179-01-E

Revision date: 06.12.2022

Characteristics:

- Motor 0,37 kW or 0,75 kW or 2.2 kW (depends on type and number of the associated calipers)
- Tank: capacity = 5L (useful 4,5L)
- Hand pump PAM
- Electronic pressure switch
- Solenoid valve 24VDC
- Damping accumulator
- Vertical installation
- Weight with oil: 24 to 40 kg without K unit

Operating conditions:

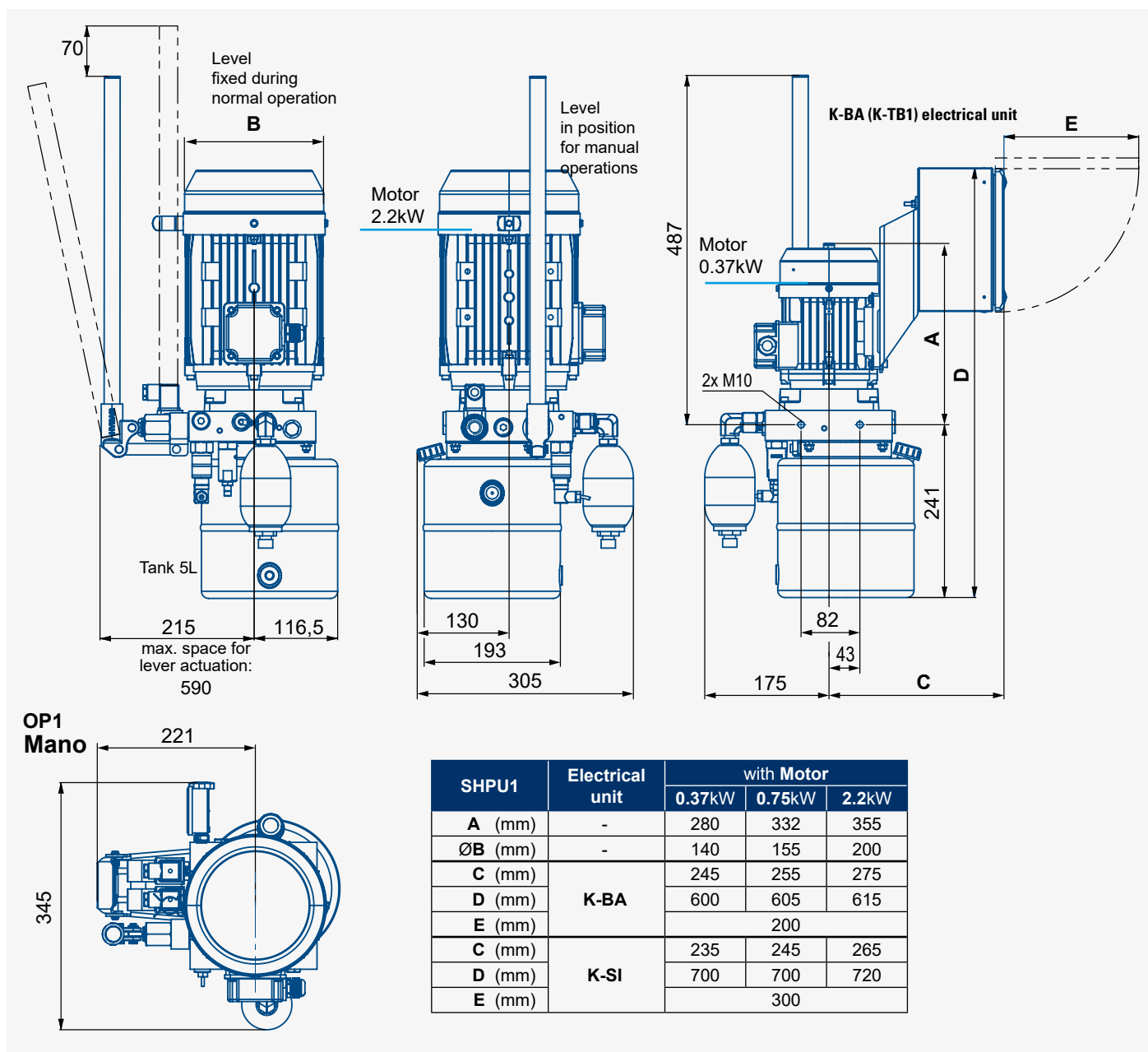
- Working pressure: 250 bars max. (except **SHM10**: 90bars) service: 180/200bars (**SHM10**: 55/10 bars)
- Ambient temperature: -20°C to +70°C ■ options SID and GF (-40°C), consult us.
- Relative humidity: ≤ 100%
- Protection level: C4M-L anti-corrosive (acc. to ISO12944) Paint C5M-L in option
- Tightness level: IP55
- Indicate operating T° for appropriate oil type

Options:

- CPS** Mechanical pressure switch
- EVS** Solenoid valve(s) 230VAC
- MS** Motor special voltage
- Mano** Manometer
- OP1-DM** Enhanced security on return circuit
- OP6** For iron and steel industry

Electrical unit: **K-TB** or **K-BA** or **K-SI** depending on options

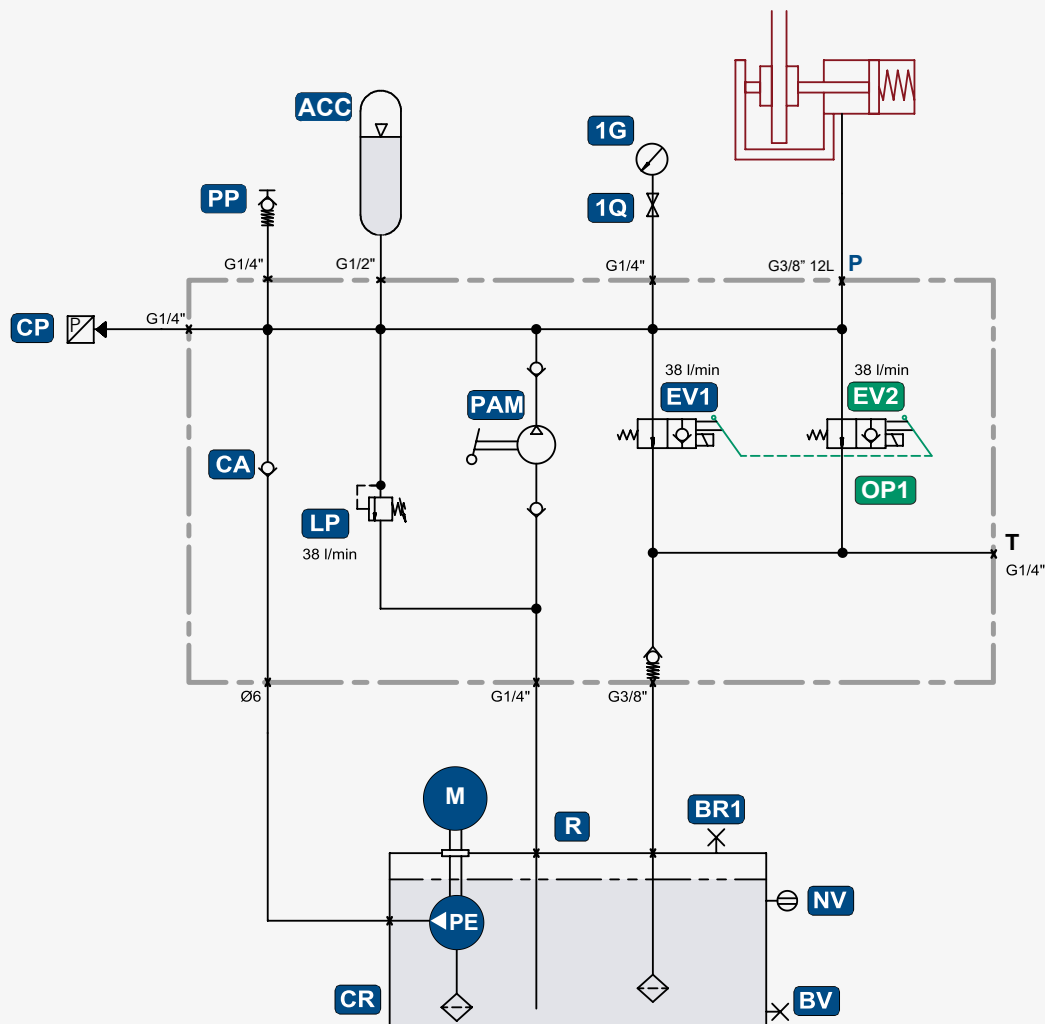
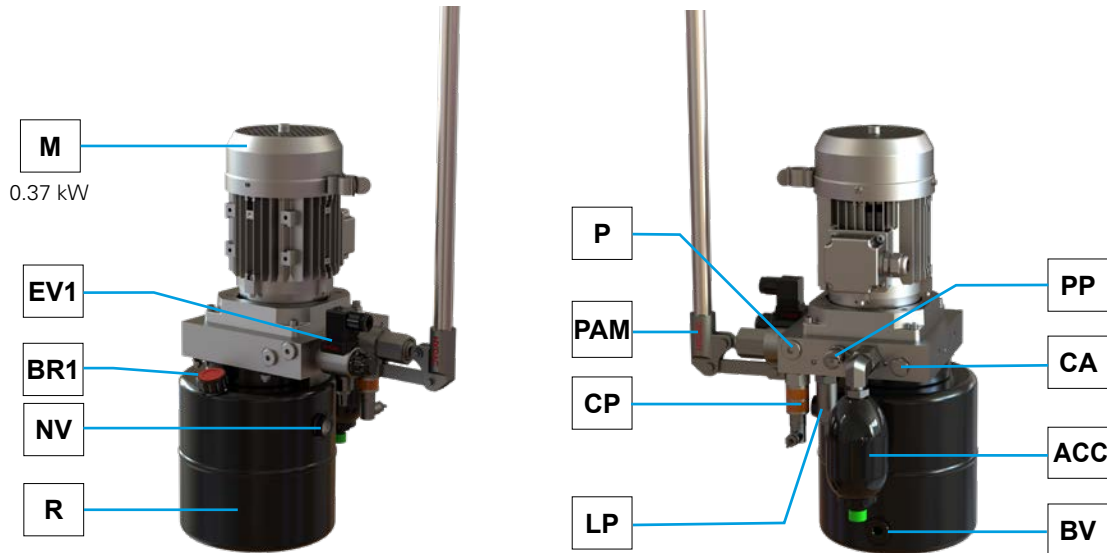
For opening and closing times, consult us.



HYDRAULIC POWER UNITS - SHPU1

Revision number: T010179-01-E

Revision date: 06.12.2022



Hydraulic Power Units

HYDRAULIC POWER UNITS - SHPU2

Revision number: T010179-01-E

Revision date: 06.12.2022

Characteristics:

- Motor 0,75 kW or 2.2 kW (depends on type and number of the associated calipers)
- Tank 8L (useful 6L) or 11L (useful 7,5L)
- Hand pump PAM-DM
- Electronic pressure switch
- Solenoid valve 24VDC
- Damping accumulator
- Clogging and oil level visual indicators
- Vertical installation
- Weight with oil and without K unit:
tank 8L: 36 to 49 kg / tank 11L: 39 to 52 kg

Operating conditions:

- Working pressure:
250 bars max. (except **SHM10**: 90bars)
service: 180/200bars (**SHM10**: 55/10 bars)
- Ambient temperature: -20°C to +70°C ■
options SID and GF (-40°C), consult us.
- Relative humidity: ≤ 100%
- Protection level:
C4M-L anti-corrosive (acc. to ISO12944)
Paint C5M-L in option
- Tightness level: IP55
- Indicate operating T° for appropriate oil type

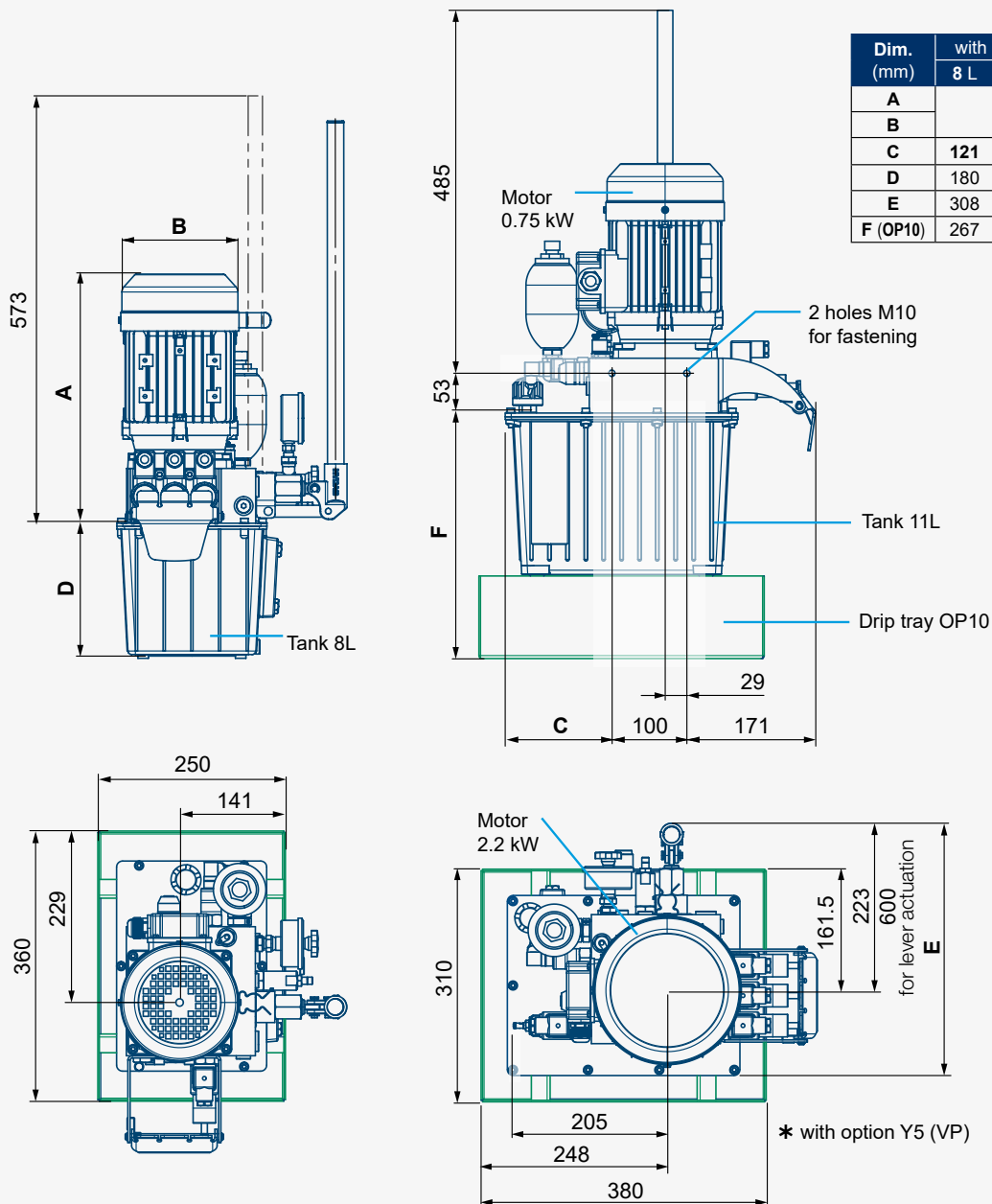
Options:

CPS - EVS - MS - OP6

- OP1** Enhanced security on return circuit
- OP1-OP2** Manual lowering with dead man safety or with overspeed detection by solenoid valve
- or OP3**
- Y5** Regulated braking
- Y1-3** Stepped braking
- OP5E** Electrical clogging indicator
- OP7-8** Oil temperature & level electrical indicator
- OP10** Drip tray / Oil heater (11L tank) (APS)

Electrical unit: **K-TB or K-BA or K-PR or K-SI**
depending on options

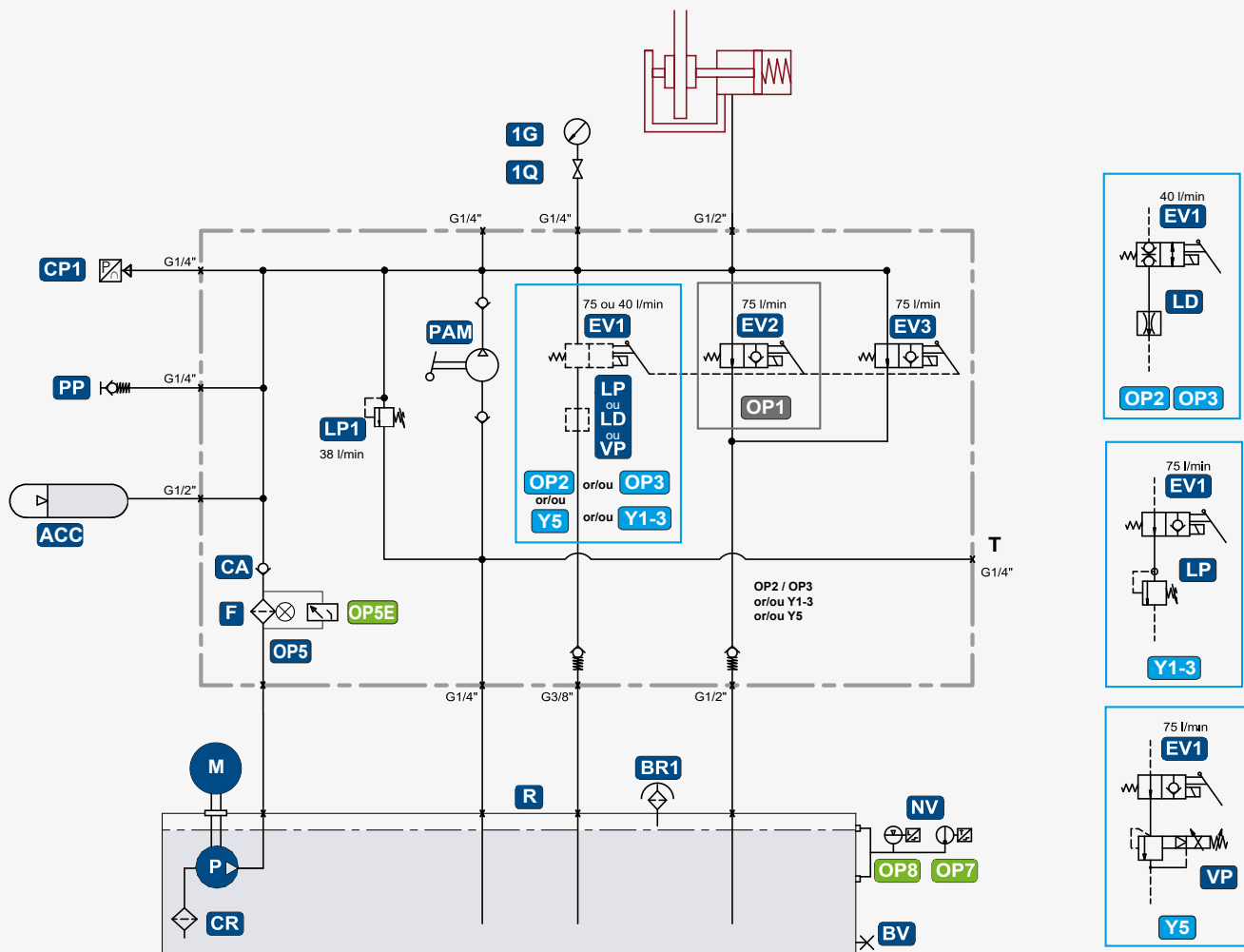
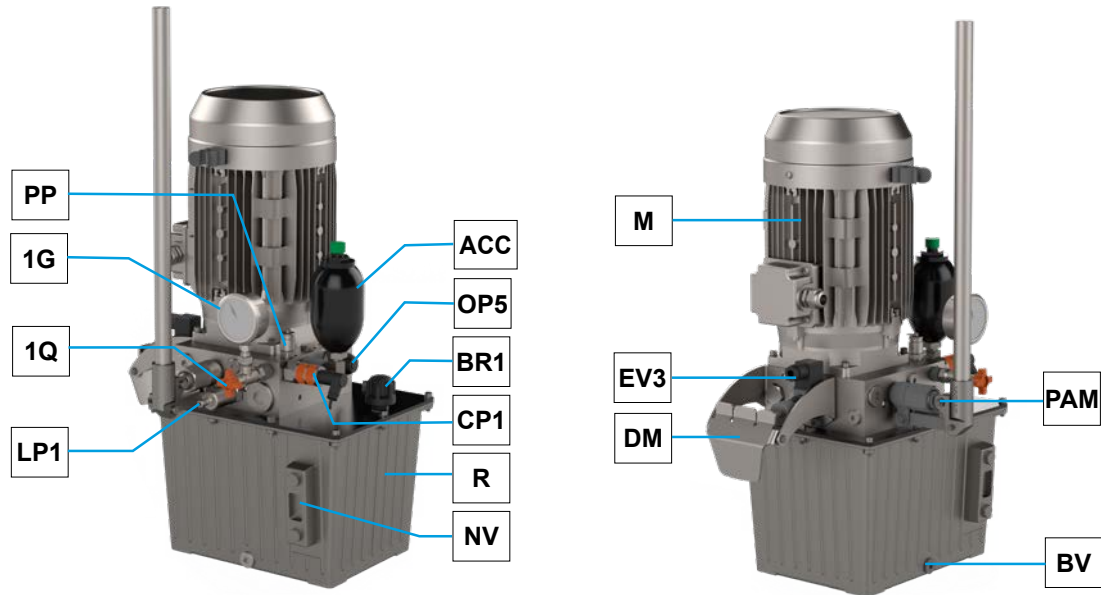
For opening and closing times, dimensions with electrical units, consult us.



HYDRAULIC POWER UNITS - SHPU2

Revision number: T010179-01-E

Revision date: 06.12.2022



Hydraulic Power Units

HYDRAULIC POWER UNITS - SHPU3

Revision number: T010179-01-E

Revision date: 06.12.2022

Characteristics:

- Motor 0,75 kW or 2.2 kW (depends on the associated calipers type and number)
- Tank 35L (useful 30L) or 8L (useful 6L)
- Hand pump PAM-DM
- Electronic pressure switch
- Solenoid valve 24VDC
- Damping accumulator
- Clogging and oil level visual indicators
- Vertical installation
- Weight with oil and without K unit:
tank 35L: 85 to 110 kg / tank 8L: 46 to 60 kg

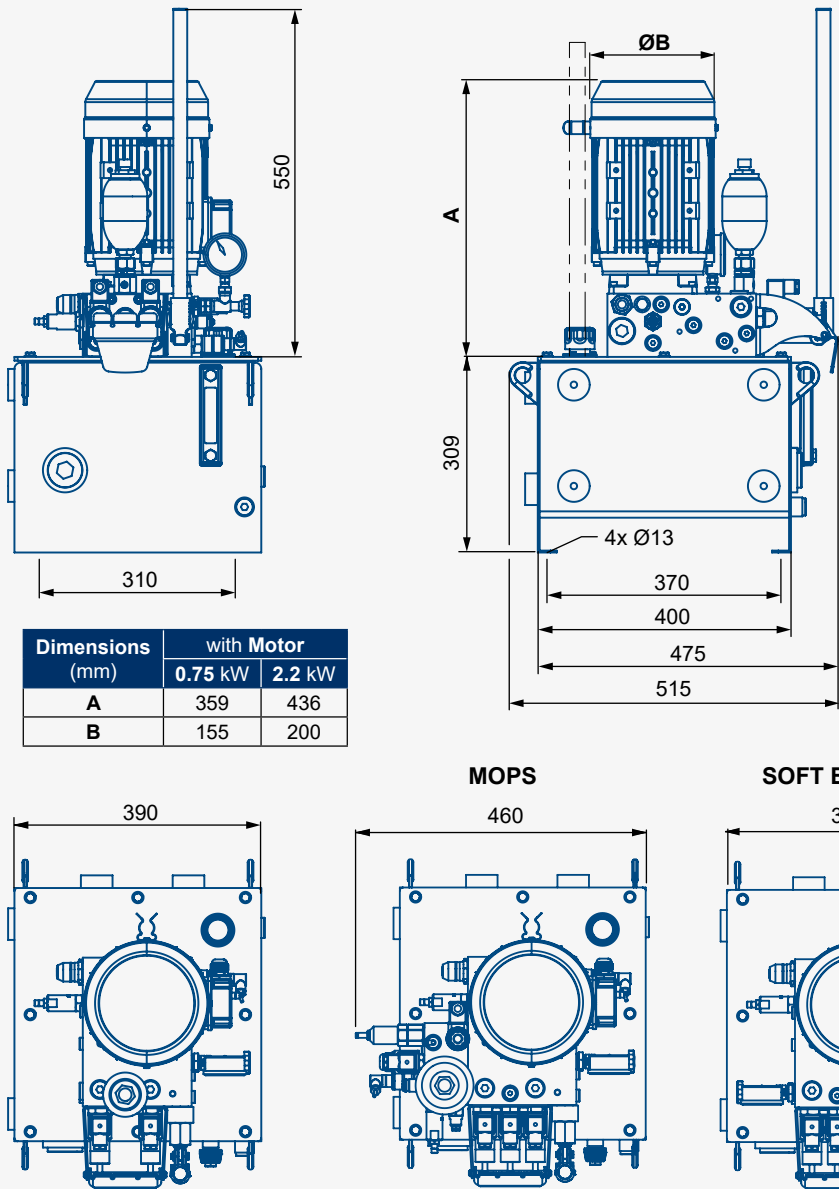
Operating conditions:

- Working pressure:
250 bars max. (except SHM10: 90bars)
service: 180/200bars (SHM10: 55/10 bars)
- Ambient temperature: -20°C to +70°C ■
options SID and GF (-40°C), consult us.
- Relative humidity: ≤ 100%
- Protection level:
C4M-L anti-corrosive (acc. to ISO12944)
Paint C5M-L in option
- Tightness level: IP55
- Indicate operating T° for appropriate oil type

Options:

- CPS - EVS - MS - OP1 - OP5E - OP6 - OP7-8 - OP10**
OP1-OP2 or OP3 Manual lowering with dead man safety or with overspeed detection by solenoid valve
Y5 Regulated braking
Y1-3/OP1 Stepped braking
SOFT BRAKING need a specific calculation for hydraulic design, consult us
MOPS
ACC+
Electrical unit: **K-TB or K-BA or K-PR or K-SI** depending on options

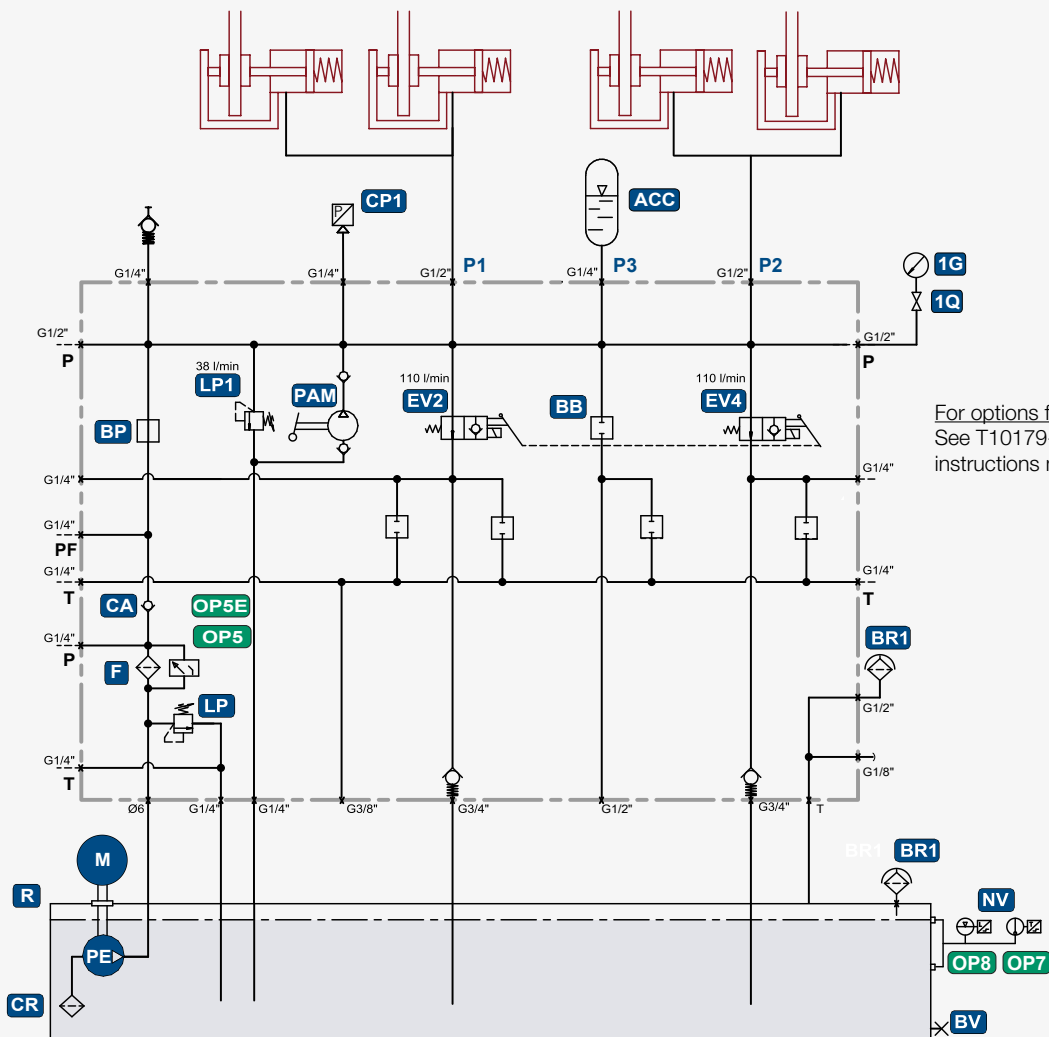
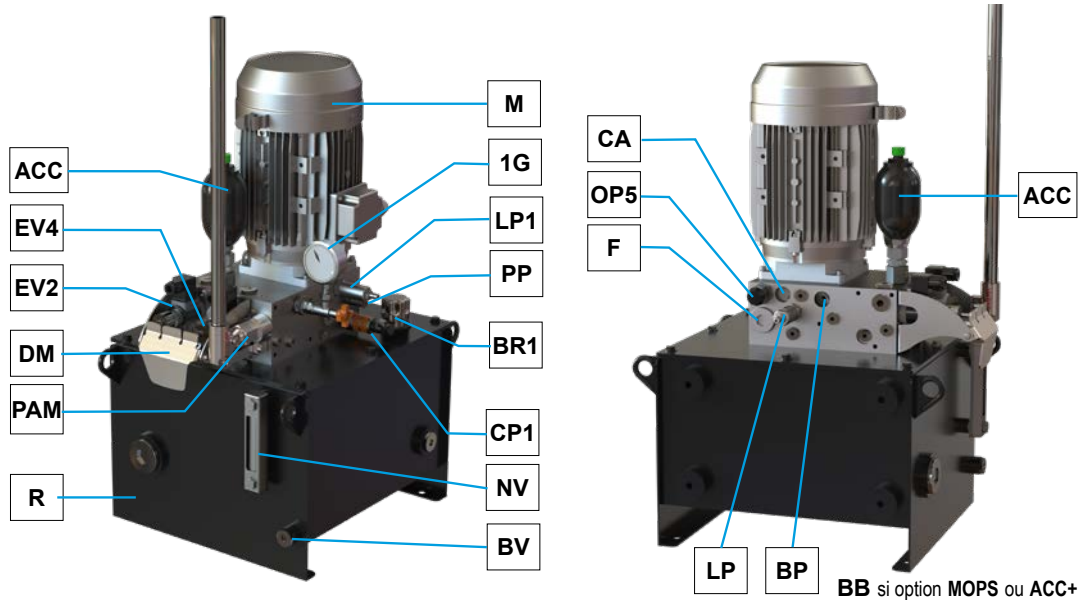
For opening and closing times, dimensions with all the other options, consult us.



HYDRAULIC POWER UNITS - SHPU3

Revision number: T010179-01-E

Revision date: 06.12.2022



For options flow diagrams:
See T10179-01 and M10183-01
instructions manuals.

Hydraulic Power Units

HYDRAULIC POWER UNITS - SHPU4

Revision number: T010223-01-B

Revision date: 08.04.2025

Characteristics:

CC	Recirculation : Continuous rotation of the motor for high-rated operation, monitoring and regulation of the pressure in the brakes and in the accumulators by 2 pressure switches.
M	Motor 2,2kW 440V 60Hz
Pump	5.8 cm ³ Flow rate : 50Hz: 7.5l/min - 60 Hz: 9l/min
T	Tank 60L
PAM	Hand pump
CSI	Pressure sensors
EV24	Solenoid valves 24VDC
OP1/2-3	Lowering of the load with dead man safety device or with electrical safety
OP5E	Clogging electrical indicator
OP6	Iron and steel environment

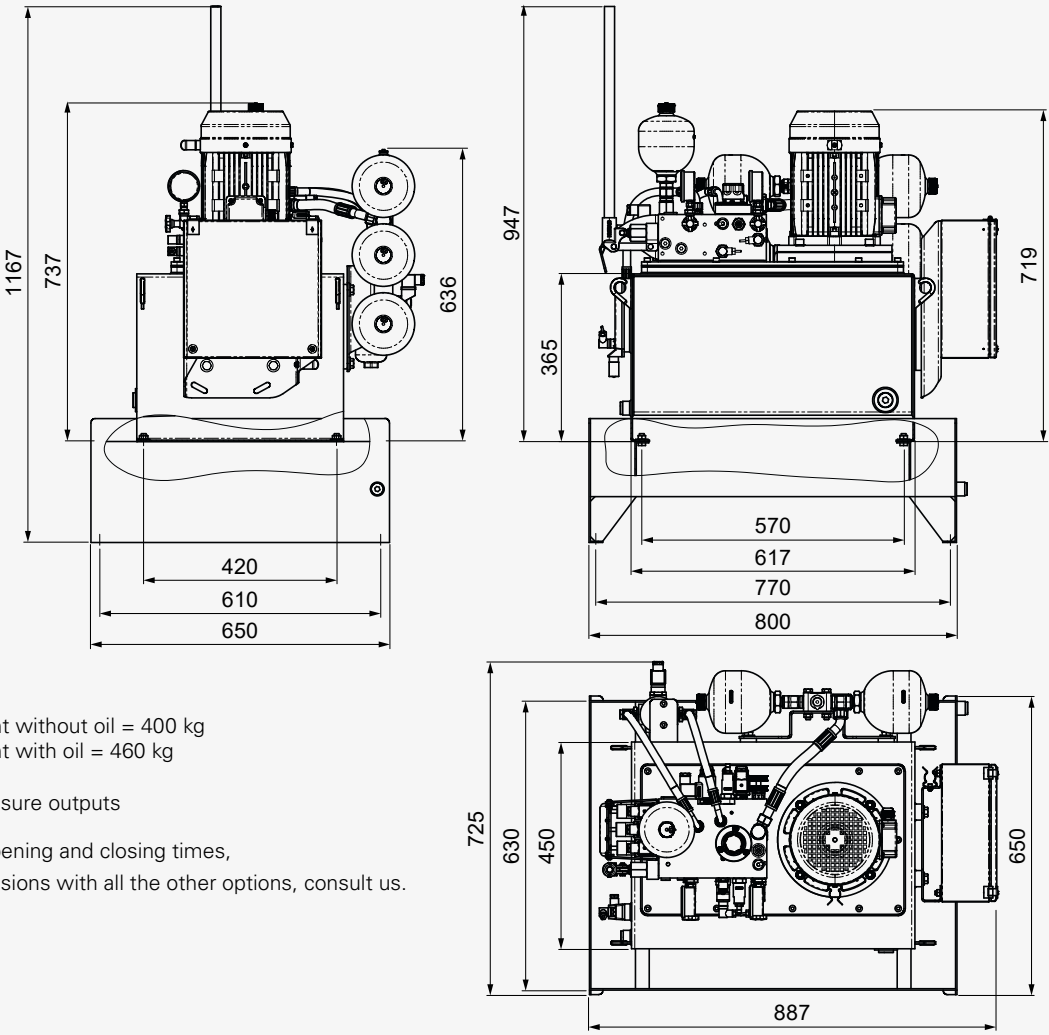
OP7-8	Oil temperature and level electrical indicators
ACC+	6 accumulators 1L
K-TB2	Electrical unit

Options:

EVS	Solenoid valves special voltage
CPE	Electronic pressure switch
CPS	Mechanical pressure switch
OP10	Drip tray
Y5	Regulated Braking cannot be combined with Soft Braking option
Y1-3-OP1	Stepped Braking
Soft Braking	cannot be combined with Y5 option
SHPU4	HPP cannot be combined with MOPS option

Operating conditions:

<u>Working pressure:</u> 250 bars max. service: 180/200 bars
<u>Ambient temperature:</u> -20°C to +70°C OP6 option enables to work in atmospheres with high concentration of dust and at ambient temperature of 60°C in continuous (90°C at the peak < 2 minutes 6 times per hour maximum).
<u>Relative humidity:</u> ≤ 100%
<u>Protection level:</u> C4M-L anti-corrosive (ISO12944) Paint C5M-L in option
<u>Tightness level:</u> IP55



HYDRAULIC POWER UNITS - SHPU4

Revision number: T010223-01-B

Revision date: 08.04.2025



Hydraulic characteristics:

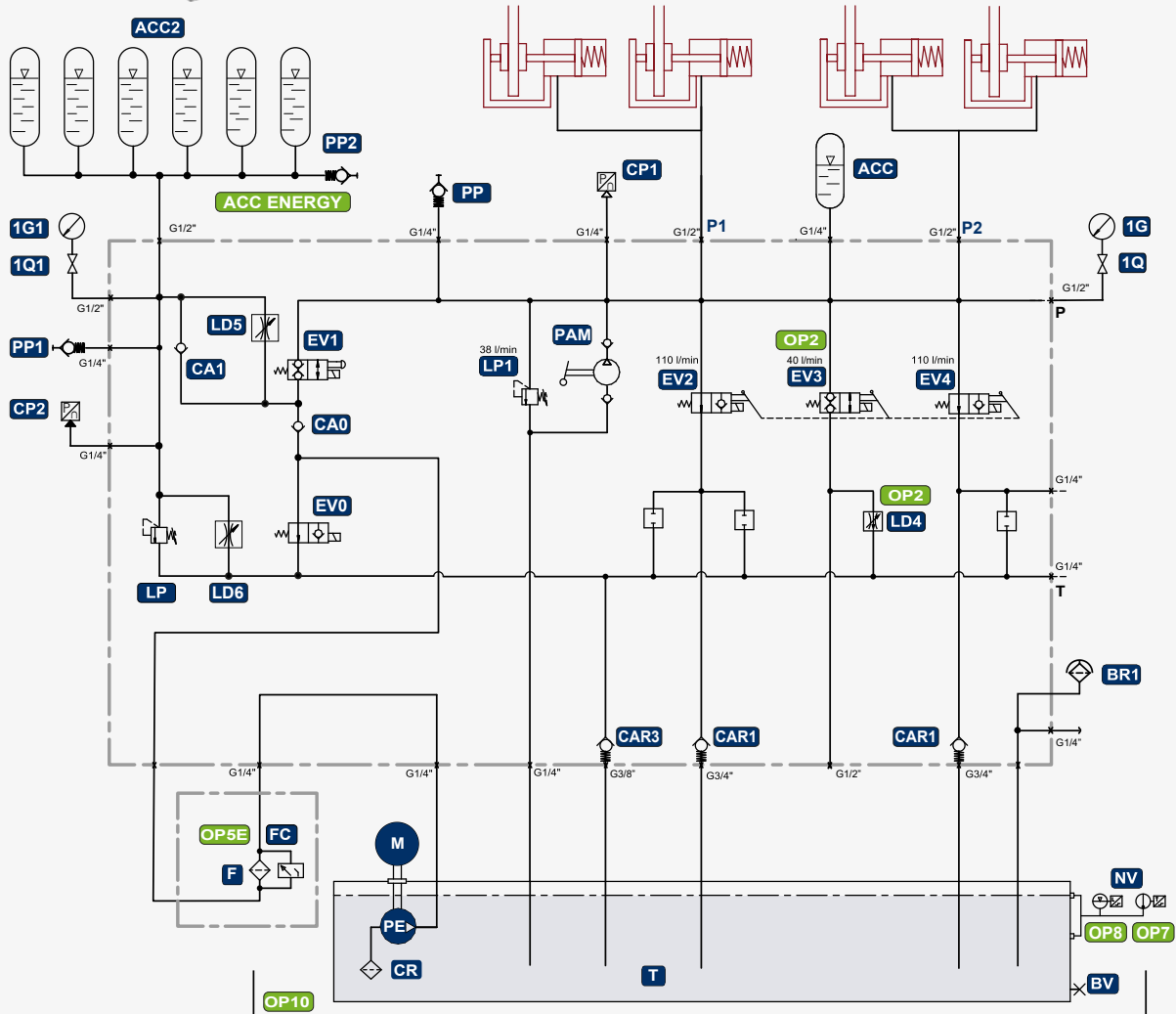
A mineral oil must be imperatively used.
Characteristics conform to the standard ISO 6743/4.
Grade L-HV 32 or 46
Choose a type in accordance with the temperatures of utilization.
For oils with other characteristics, consult us.

Oil volume = 60 L
Total tank volume = 80 L

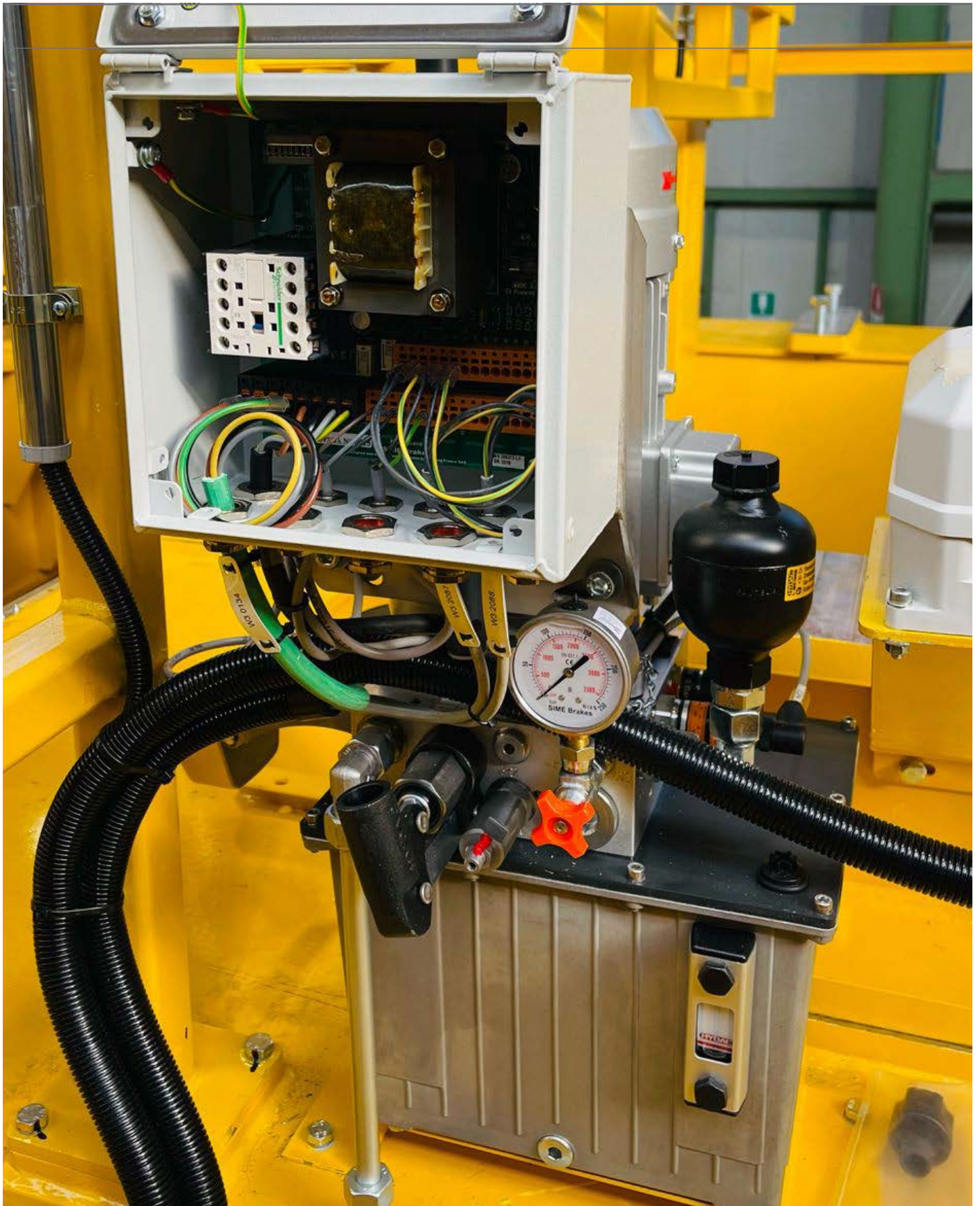
Calipers associations:

See the table at the beginning of the chapter

Rate: 40 actuations/hour (150 at peak times)



HYDRAULIC POWER UNITS - SHPU



HYDRAULIC POWER UNITS - SHPU

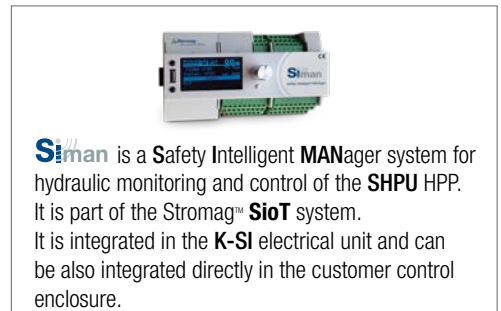
Revision number: T010179-01-E

Revision date: 06.12.2022

ELECTRICAL UNITS FOR HYDRAULIC POWER UNITS SHPU

K-TB	K- T Box (Terminal Box) / K-TB1 or K-TB2: 10 or 20 inputs/outputs
K-BA	K-Basic
K-PR	K-Premium
K-SI	K-Siman
K-PR-Y5 *	K-Premium with amplifier for Y5
K-SI-Y5 *	K-Siman with amplifier for Y5

* Consult us



SHPU1			SHPU2			SHPU3 - 35L / SHPU4			SHPU3 - 8L		
STANDARD			STANDARD			STANDARD			Soft Braking		
OP1			OP1			OP1			MOPS		
			OP5E			OP5E			OP5E		
			OP7-8			OP7-8			OP7-8		
			OP1-OP2			OP1-OP2					
			OP1-OP3			OP1-OP3					
			Y1-3			Y1-3					
			Z			Z					
			Y1-3 Z			Y1-3 Z					
			Y5 *			Y5 *					
						ACC+					
						Soft Braking					
						MOPS					

* Consult us

K-BA Basic	
K-PR Premium	
K-SI Siman	
K-TB TBox	



K-TB1

Terminal Box



K-BA

Basic Electrical Unit



K-PR

Premium Electrical Unit



K-SI

Electrical Unit with **Siman**

Lowering unit

LOWERING UNIT

THE LOWERPRO SYSTEM ALLOWS TO CONTROL LOWERING OF THE LOAD IN A SIMPLE AND SAFE WAY.

This new autonomous lowering unit includes advantages of ergonomics and safety. In the event of a power failure or special conditions, the technician is able to control the lowering of the load quickly and effortlessly, in optimal safety conditions.

The LOWERPRO can be brought and connected easily on the installation. It is fitted with a dead man safety device and can be fitted with OP2/OP3 functions for electrical control of the speed and/or the disc temperature. A control wheel and pressure gauges provide utilisation comfort and precise control.

Stromag offers training in real conditions (load 8 T, lowering height : 5m), consult us.

Benefits include

- Ergonomics: steering wheel, pressure gauges
- Comfort in use: effortlessly rechargeable energy reserve
- Lowering controlled with precision
- Dead man safety device
- Lowering possible in case of power failure
- Easy transport and connection
- Adaptation to the installation with quick couplings and starting up by our team.
- Options: Accessory kit, OP2/OP3 functions.

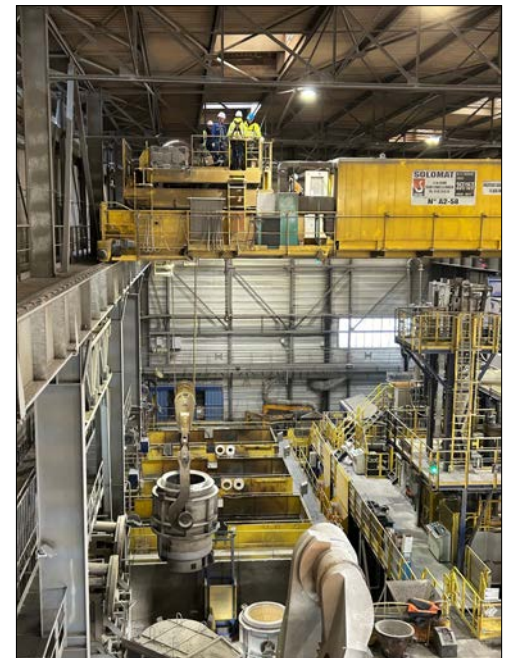
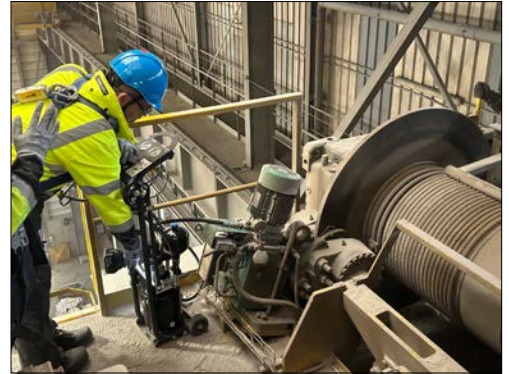
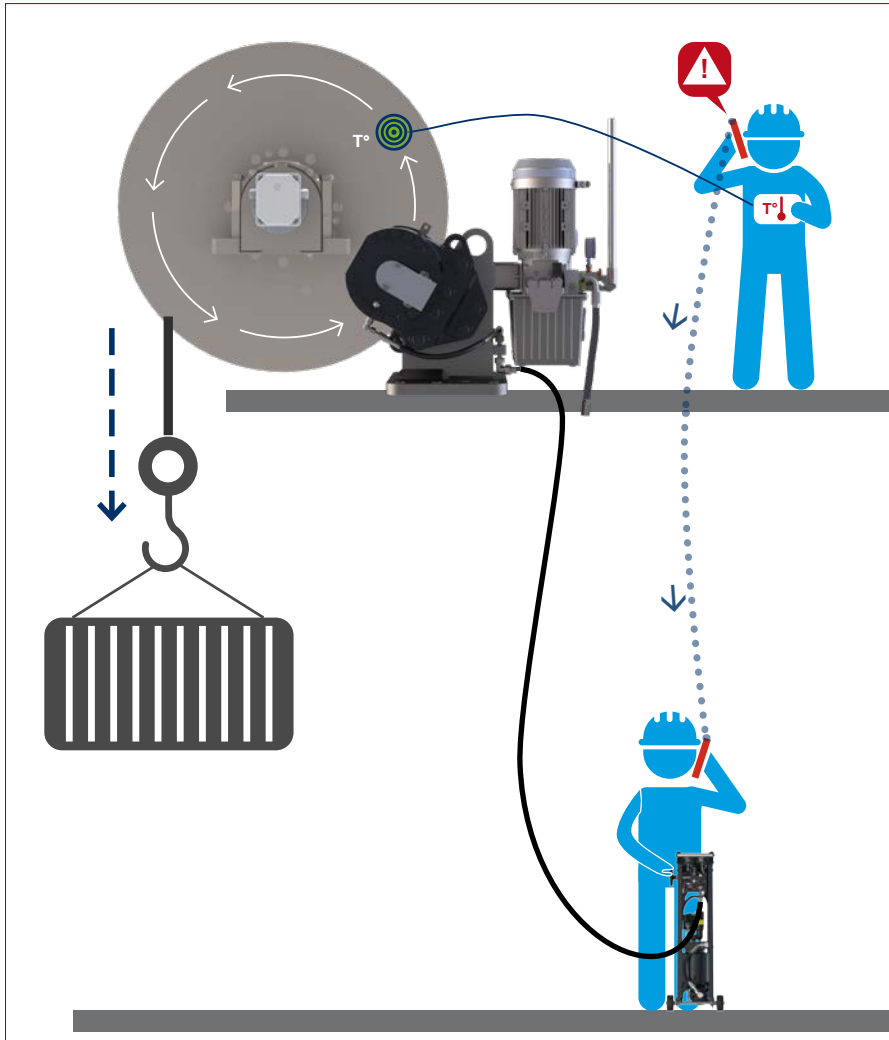


Accessory kit

- Electric screwdriver
 - Charger
 - Pyrotechnic probe
- Capillary hose:
Ø4 / length: 10 to 50 m
(10 meter modules)

Weight ≈ 30 kg

Height ≈ 1 m



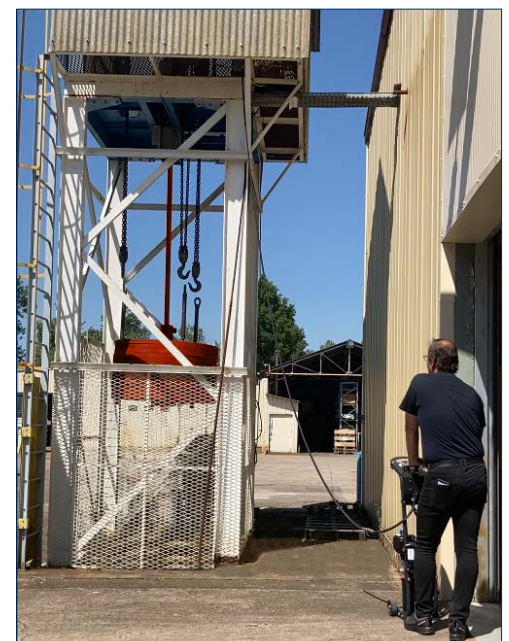
Lowering is an EXCEPTIONAL operation

To ensure safety, 2 people are necessary to carry out a lowering:

1 person to control the lowering / action on the lowering unit

1 person to monitor load temperature or/ and load speed

*Simulation in real conditions
8T lowering*



Lowering unit

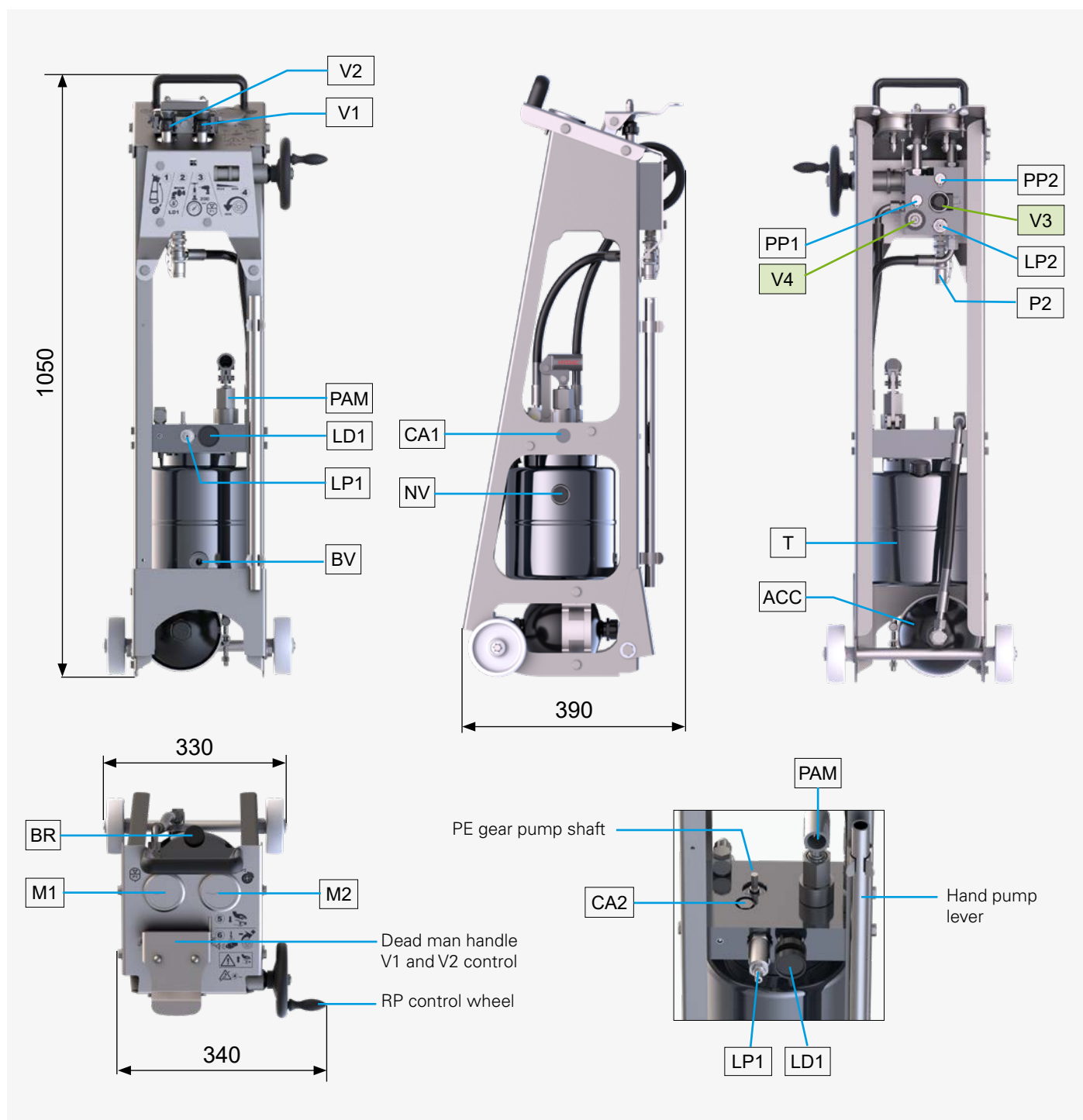
LOWERING UNIT - LOWERPRO

Revision number: T10214-01-C

Revision date: 21.01.2025

LowerPro exists in 2 versions:

- 947-94490: with dead man safety (**V1 + V2**)
- 947-94500: with dead man safety (**V1 + V2**) and electrical safety (**V3 + V4**) (double **OP3** option) to be connected to the load speed or/and the disc temperature detection system of the customer



LOWERING UNIT - LOWERPRO

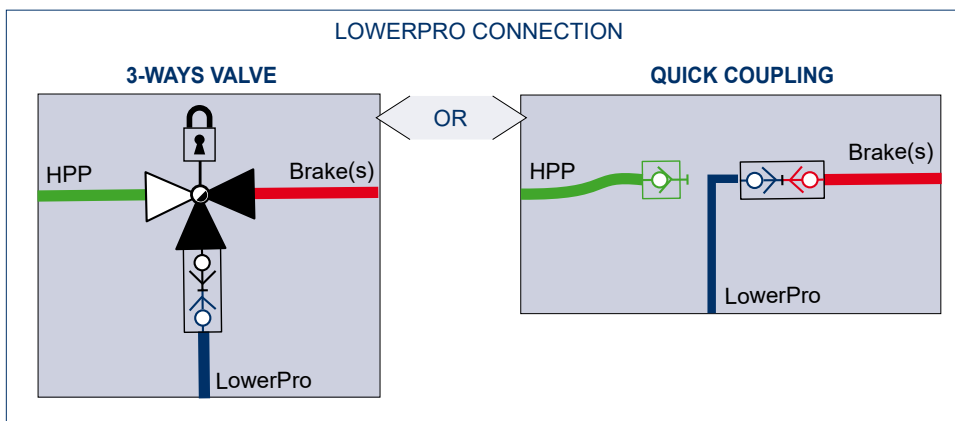
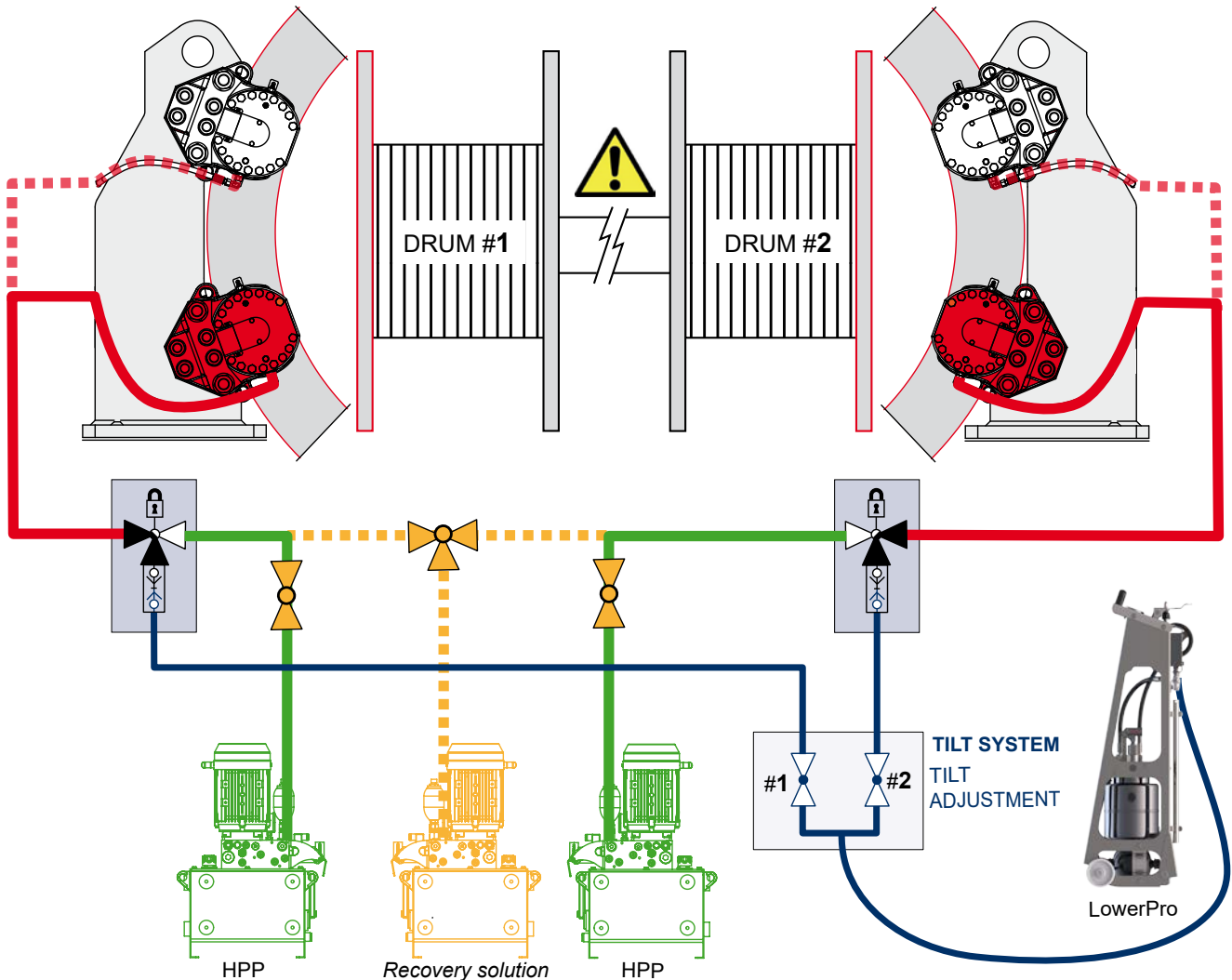
Revision number: T10214-01-C

Revision date: 21.01.2025

CONNECTION EXAMPLE

Installation with risk of shaft breakage - 2 HPP - 2 drums

For any other installation configuration, please contact us.



SAFETY SYSTEMS



BRAKING SOLUTIONS FOR	APPLICATIONS
• HOISTING SPEED MONITORING • BRAKING SYSTEM CONTROL • REGULATED DECELERATION • SPEED REGULATION / CONSTANT DECELERATION • SAFETY PERFORMANCE LEVEL PL d to PL e	• MASS TRANSPORTS: CABLEWAY, PASSENGERS ELEVATORS FUNICULARS, CHAIRLIFTS... • STEEL INDUSTRY LADLE CRANE • BELT CONVEYORS

SPEED MONITORING



Limit Switch series 51

- Provide information on :
 - the position (drum angular, hoisting height)
 - the speed (frequency) via the encoder
- Configuration in accordance with the installation requirements
- With polycarbonate or aluminium housing



SIDEOS one / SC / V4

Configurable Monitoring Systems

- **SIDEOS One** monitors 3 speed thresholds, the stop and the rotation direction of the installation
- **SIDEOS SC** monitors variable speeds
- **SIDEOS V4** secures the kinematic chain of the lifting equipment

BRAKE MONITORING



SIBRAKE

- SIBRAKE module collects and processes the raw data of the sensors to enable the real-time monitoring of the brake.
- It can also be used to monitor a set of two brakes associated on the same disc.

BRAKING SYSTEM CONTROL AND MONITORING



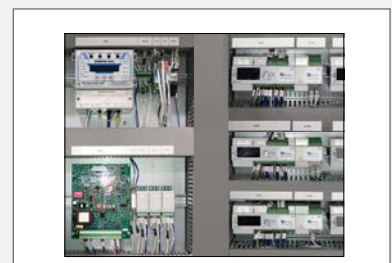
AFR5 Systems

- MONITORING & CONTROL SYSTEMS for regulated braking adapted to the customer installation.
- includes:
 - SIDEOS system(s)
 - CRD® deceleration regulation module(s)
 - CRV® speed regulation module(s)



SIMAN

- SAFETY INTELLIGENT MANAGER of the Hydraulic Power Units with Ethernet connection (in option)
- SIMAN SAFETY: Safety functionality
- SIMAN ADVANCED:
 - General functionality
 - Operation monitoring



SIGMA Systems

- SAFETY of the emergency braking system of lifting installations
- MANAGEMENT of the installation functionality, CONTROL of several operating modes including load lowering
- PREVENTION of breakdowns
- EASE to use thanks to its HMI

SPEED MONITORING

LIMIT SWITCHES

Precise measurement of the lifting equipment positions



Our **geared cam limit switches** reliably switch off sequences of movements, and position or restrict these with independently and precisely adjustable cam discs. These geared cam limit switches can easily determine absolute positions to a high precision that can be converted into reliable additional data like e.g. sense of rotation and overspeed. Data are transferred to SIDEOS monitoring systems to secure the lifting installation.

- Patented planetary gears
- Cam adjustments at fixed position in housing (simple and precise adjustment)
- Large cam disc diameter
- Modular design with many identical parts
- 4.1–16,000 usable revolutions
- More contacts possible on request
- Various housing designs
- Approved under DGUV V17
- Direct drive of multi-turn encoders

SIDEOS V4

Kinematic Chain Monitoring Module

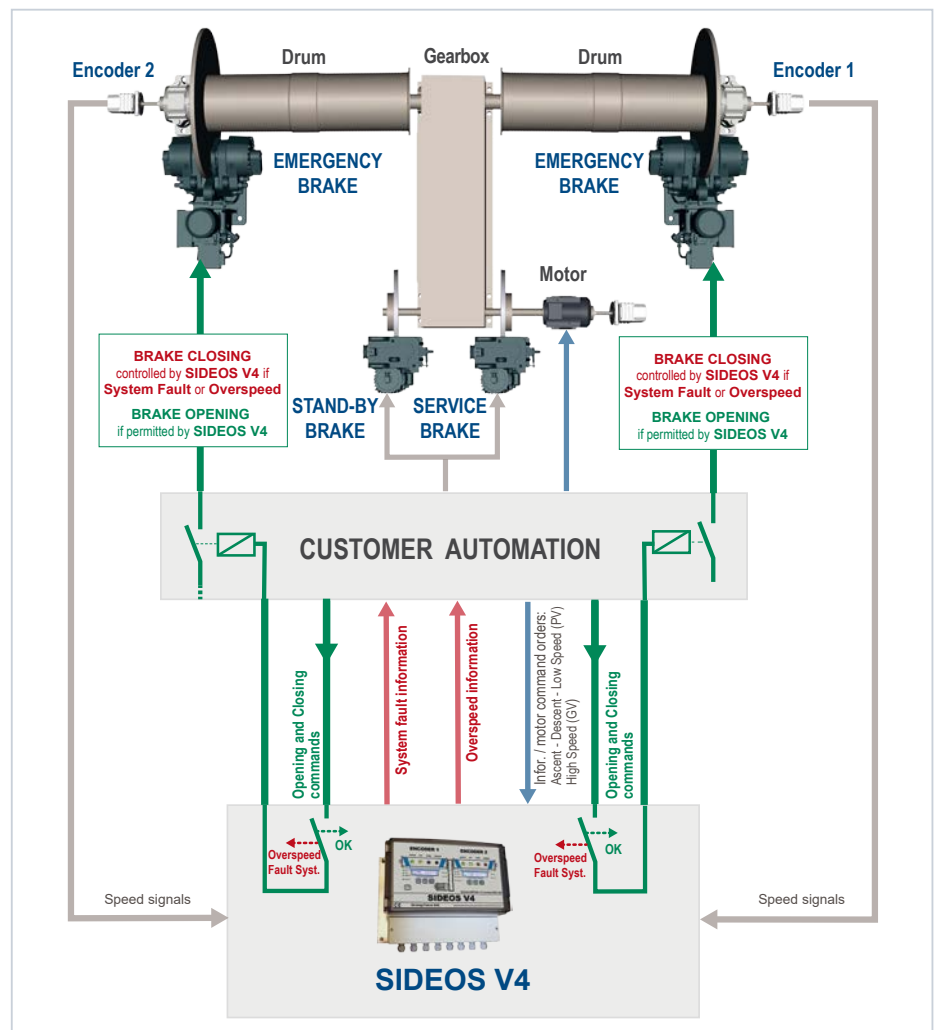


SIDEOS V4 secures the kinematic chain of the lifting equipment.

It can be used in configurations:

- Drum / Motor
- Drum / Drum

For safety level up to PLe category 4



SIDEOS ONE

Speed Monitoring Module



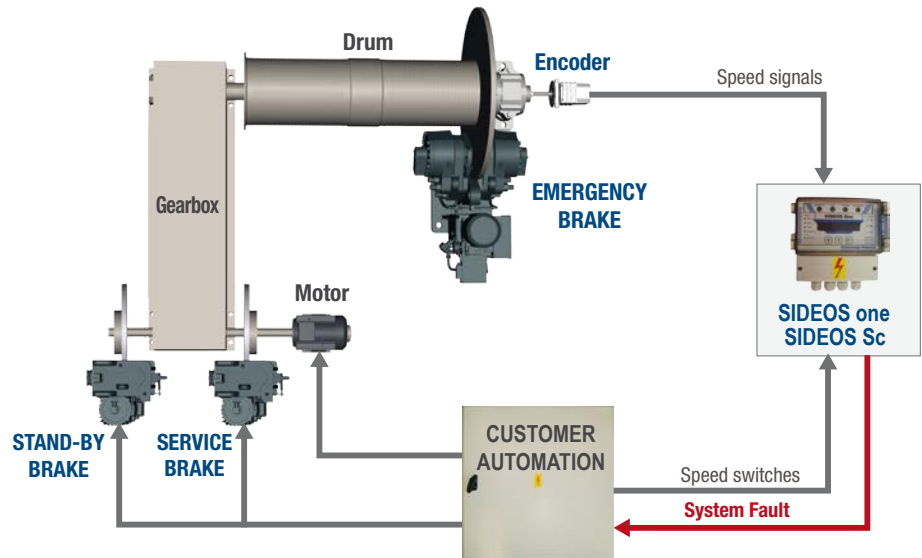
SIDEOS One is designed to monitor:

- 3 speed thresholds
- the shutdown of the installation
- the rotation direction of the installation

It detects:

- Overspeed
- Static and Dynamic Slipping

For safety level up to PLe category 4



SIDEOS SC

Variable Speed Monitoring Module



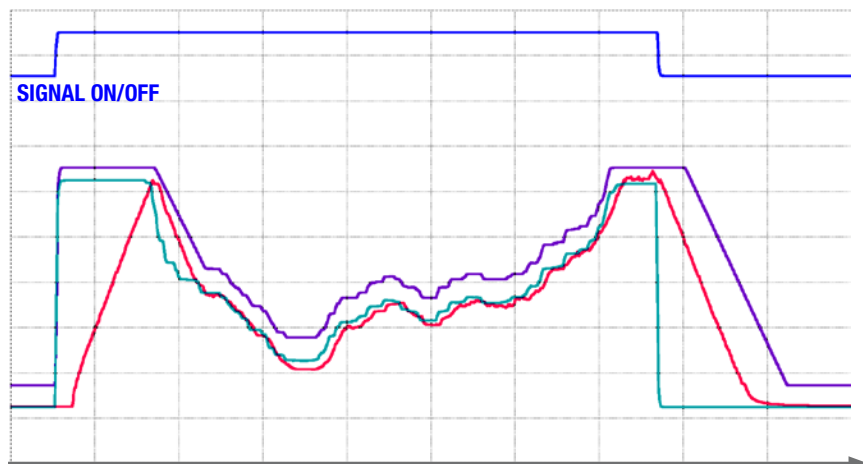
SIDEOS Sc is designed to monitor:

- 1 variable speed threshold (speed controlled by joystick)

It detects:

- Overspeed
- Underspeed
- Static and Dynamic Slipping

For safety level up to PLe category 4



SET POINT is given to the variator by the joystick

SPEED THRESHOLD = Variator set point + 10% of the nominal speed

REAL SPEED

SPEED MONITORING - LIMIT SWITCHES SERIES 51

Revision number: T10003-01-G

Revision date: 31.10.2024

CONFIGURATION

- > Geared cam limit switches series 51 contain in a same housing: a gear box, dry contacts, eventually, an incremental encoder.
- > They provide information on :
 - the position (angular of the drum, hoisting height) via the dry contacts,
 - on the speed (frequency) via the encoder.
- > They can be fitted with a push-pull incremental encoder, hereafter referred to as "encoder". In this case, the housing is usually fitted with a second cable gland.
- > Parameters of configuration are :
 - the size of the limit switch (define the useful rev. number),
 - the number and type of contacts,
 - the angle on the limit switch cams,
 - if with encoder : the pulses number per rev. of the encode,
 - the housing type.

NOTE !

Be careful that the angle traveled by the cam on the stopping distance is smaller than the cam angle.

(ex. : cam of 15° → travel < to 15° on the stopping distance).

In case of a longer stopping distance, we recommend the utilization of cams of 40°.

Consult us for configuration assistance.

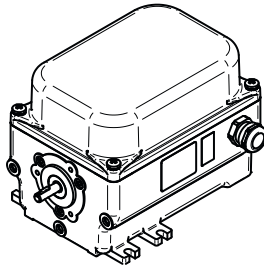
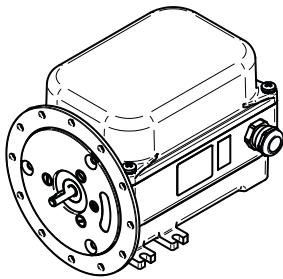
- > The limit switch with polycarbonate housing, is in a modular design. Its overall length depends on :
 - the gear reduction,
 - the number of contacts, and
 - the selection or not of an encoder..
- > The polycarbonate housing is modular (by means of spacers) and suits all configurations.
- > Configurations which can be installed in an aluminum housing (only one dimension) are sum up in the opposite table (Max. number of contacts with or without encoder)

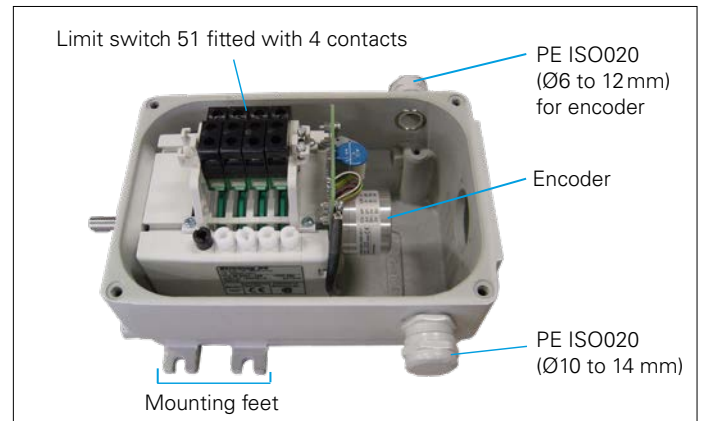
NUMBER OF USABLE REVOLUTIONS

SIZE	Number of usable revolutions for cams of	
	15°	40°
4.1	4.1	3.8
6.5	6.5	6.2
11	11	10
17.5	17.5	16
29	29	27
48	48	44
75	75	70
125	125	115
205	205	185
323	323	300
540	540	495
880	880	800
1384	1384	1280
2288	2288	2100
3735	3735	3400
5900	5900	5500
9800	9800	9000
16000	16000	14500

ALUMINIUM HOUSING IP65 (NMH/BMH)

- > For use in harsh environments
- > Opening upwards, manage a clearance of 55 mm minimum.

> Construction B3: Housing fitted with 4 mounting feet (Ø 7mm, center distance = 40 x 130)  H=142 L=191 l=140	> Construction B3/B5: Housing fitted with 4 mounting feet and an aluminum flange (12 holes Ø 6,4 on Ø 145 ±0,1)  H=142 L=191 l=160
---	---



SIZE	Maximum number of contacts	
	Without encoder	With encoder
4.1 to 11	8	6
17.5 to 48	8	6
75 to 205	8	6
323 to 880	6	4
1384 to 3735	6	4
5900 to 16000	4	4

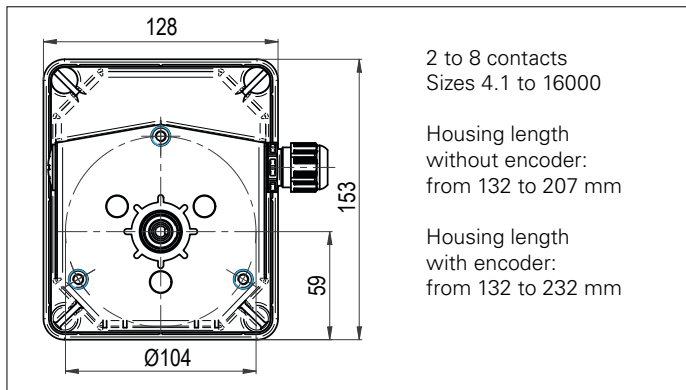
SPEED MONITORING - LIMIT SWITCHES SERIES 51

Revision number: T10003-01-G

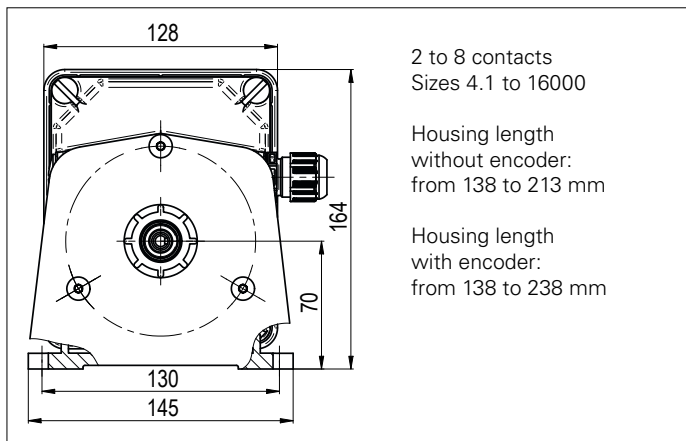
Revision date: 31.10.2024

POLYCARBONATE HOUSING IP66 (NM/BM)

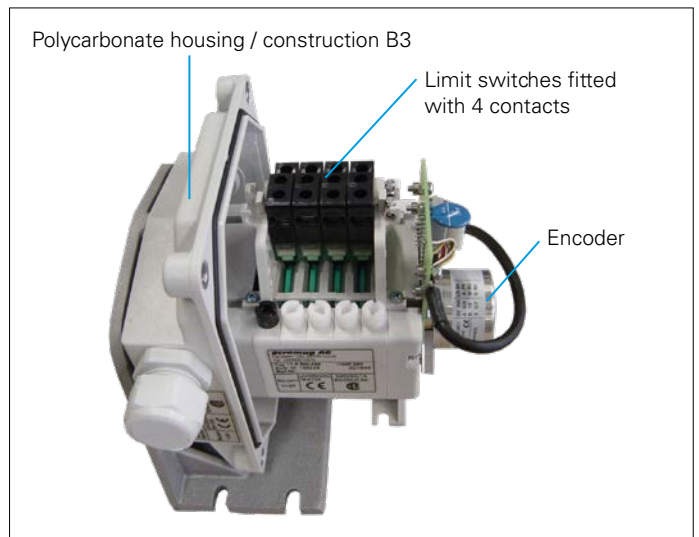
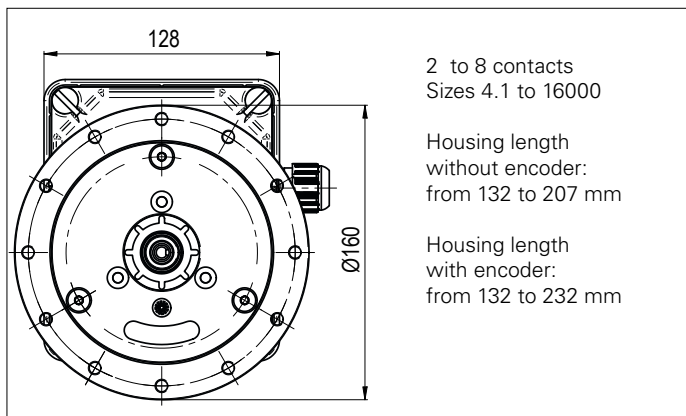
- > To dismount the housing, manage a clearance of 100 mm behind the limit switch
- > Construction B14
Fixing by 3 tapped holes (M6 on diameter 104 ±0,1)



- > Construction B3
Aluminum bracket with mounting feet
(4 holes Ø 7 mm, center distance = 35 x 130)



- > Construction B5
Housing fitted with an aluminum flange with 12 fixing holes Ø 6,4 on diameter 145 ±0,1



INSTALLATION OF GEARED CAM LIMIT SWITCH SERIES 51

Support

The support of the limit switch series 51 must be rigid enough not to amplify vibrations and shocks existing on the installation.

Drive

Drive is transmitted ideally by a torsionally stiff, flexible coupling (for example : M19 or M14) which allows compensation of axial, radial and angular misalignments of the shafts to join up.

Drive can also be transmitted radially by a chain, a toothed wheel or a synchronous belt, in this case check the max. admissible radial force (Fmax) of the input shaft.

ELECTRICAL CHARACTERISTICS OF THE ENCODER

Output circuit	Push-pull
Supply voltage (U)	8...30 V DC
Power consumption (no load)	< 40 mA
Permissible load	± 50 mA
Pulses frequency	max. 200 kHz
Signal level high	min. U - 3 V
Signal level low	max. 2,5 V
Rise time	max. 1µs
Fall time	max. 1µs
Short circuit proof outputs	yes
U reverse connection protection	yes

Conform to the standards CE : EN 50082-2, EN 50081-2 and En 55011 class B.

The encoder is specified by Stromag France after calculation in accordance with data of the questionnaire of the limit switch series 51. In standard the used encoder is a 360 pulses/revolution or in certain cases : 200, 600, 900, 1024, 2048 or 3600 pulses/revolution. For all the other encoder versions, consult us.

Safety systems

SPEED MONITORING - SIDEOS ONE

Revision number: M10054-01-H

Revision date: 01.05.2024

Configurable and secure system for speed monitoring: redundant design and fault detection system (DC>99%) which secure the overall operation of the overspeed detection system.

Conform to the machine security standards:

NF EN ISO 13489-1

Performance level PL=d to PL=e

Category: 2 to 4

MTTFd = 230.9years PFHd = 1460operations/year

Operating conditions:

- Ambient temperature: -20°C to +60°C

Attention: Using **SIDEOS One** at temperature > 60°C involves destruction of the internal power supply

- IP65 protected electrical casing

Electrical data:

- 2 versions
AC: 115/230 VAC ± 10% 50/60Hz or
DC: 24 VDC ± 15%
• Other voltages: consult us

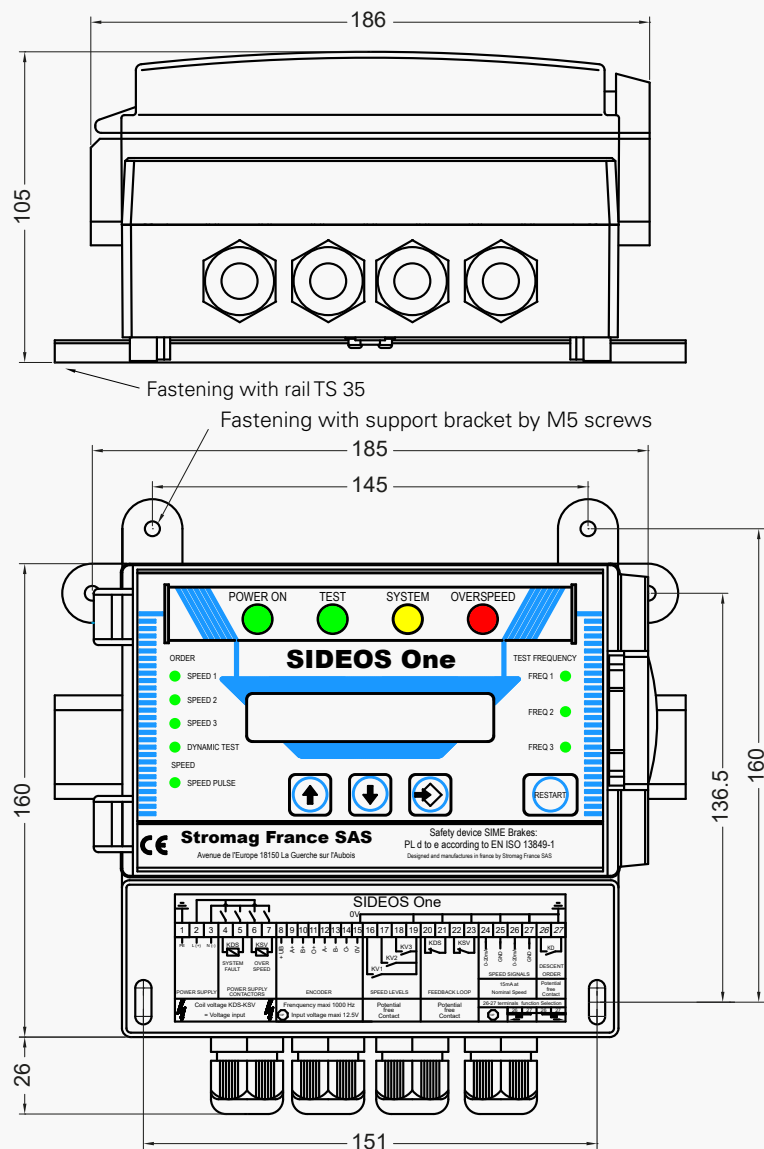
EC marking of conformity:

- 2006/42/EC directive Machine
- 2014/35/UE Low voltage directive (standard NF EN 60204-1)
- 2014/30/UE EMC directive (standards NF EN 61000-6-2, NF EN 61000-6-4)

Options:

- Steel casing IP66 IK10
- Contact module

The **SIDEOS One** can be installed in a control enclosure on an DIN rail of 35mm, or fixed with M5 screws, see the drawing below.



4 cable glands ISO20 cable Ø 6 to 12

En case of heavy vibrations, it is recommended to fasten the SIDEOS One on elastic buffers

SPEED MONITORING - SIDEOS ONE

Revision number: M10054-01-H

Revision date: 01.05.2024

For a detailed description of the **SIDEOS One** functionalities, consult the complete technical leaflet.

SIDEOS One is a configurable system for speed monitoring designed to secure the lifting of a handling equipment. **It is set according to:**

- The lifting characteristics	Parameters NC NS DT
- The selected functions	SP1-SP2-SP3 TS TS and DS RC
- The number of pulses to confirm an Overspeed	VS1 VS2 VS3



Access to the parameters is protected by a locking mode.

> **It receives:**

- The speed signal(s) of the installation
- The functional orders of the lifting control of the handling equipment

> It monitors:	and detects, in case of wrong operation:
- the lifting speed(s)	- an Overspeed
- the lifting stop (deceleration)	- a Static Slipping
- the lifting stop positioning	- a Static Slipping
- the lifting operation direction	- a Dynamic Slipping
- the lifting kinematic chain	- a Differential Speed
- the encoder	- an encoder fault
- the functional orders of the control	- a Speed contact fault
- the output contactors or relays	- a contactor fault

> **When it detects a fault, it cuts:**

- the power to the relevant output, System Fault or Overspeed

> **It signals the triggering origin:**

- via the alphanumeric display
- an auxiliary contact of the output contactors

> **It secures the global operation of the speed monitoring system by means of:**

- its redundant internal and external design and its monitoring system (DC > 99%) which allow the detection of all the internal and external failures.

> **It records:**

- The opening of the output contactors or relays and this even in case of power cut
- The 3 last Fault message

> **It releases:**

- the fault when the RESTART button is manually actuated, this action allows the control system to receive a distinct starting order.

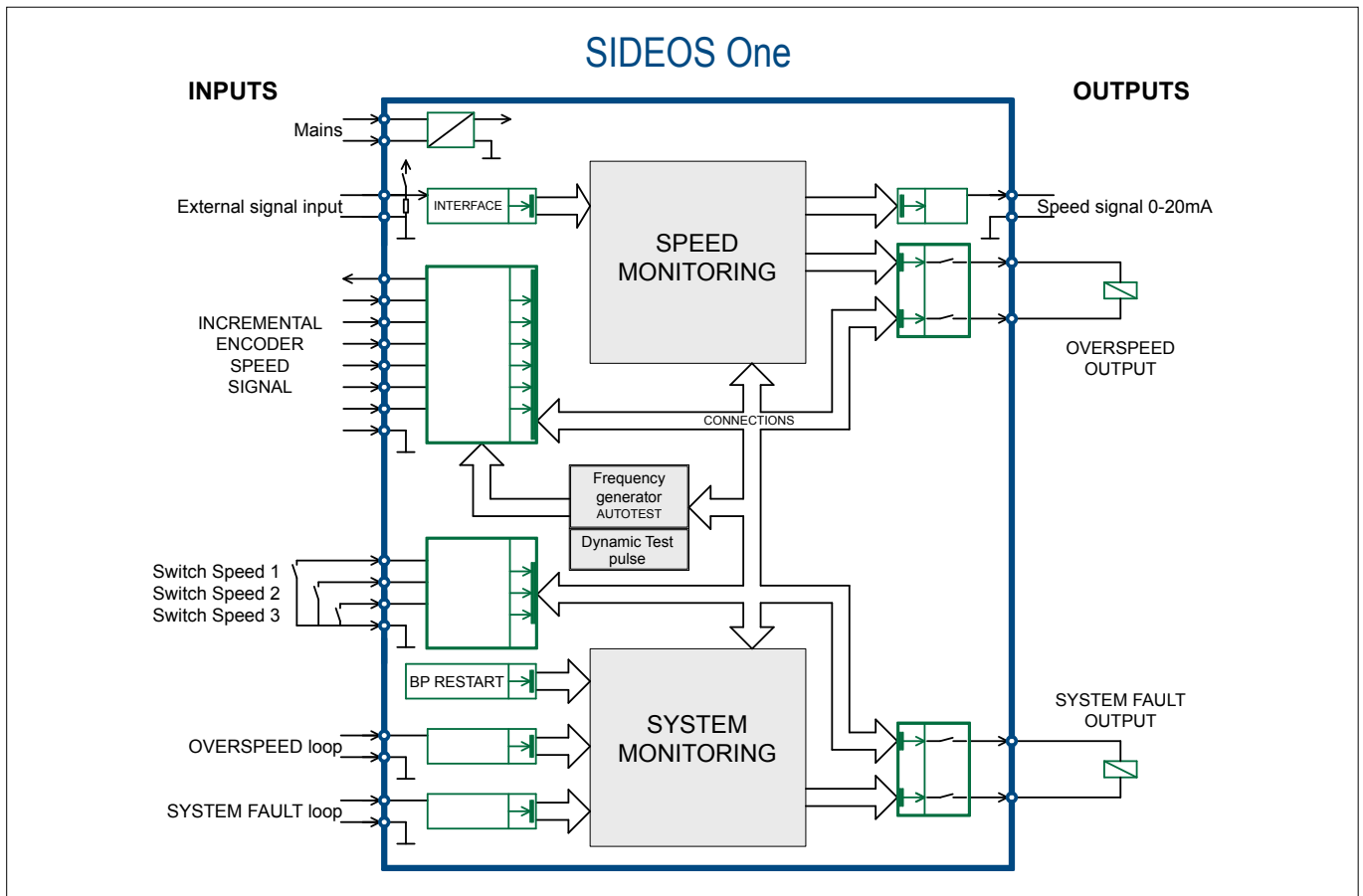
**It allows to obtain
a secured speed monitoring system
Category 2 PL d up to Category 4 PL e
according to the standard NF EN ISO 13849-1.**

SPEED MONITORING - SIDEOS ONE

Revision number: M10054-01-H

Revision date: 01.05.2024

Internal design



> External failures

The monitoring system of the **SIDEOS One** is designed to detect all the external signals failures by means of a redundant or logic treatment of the input signals.

It secures the operation of the speeds inputs, the contacts inputs, the System Fault outputs and the Overspeed outputs (DCavg>99%).

> Internal failures

The **SIDEOS One** detects all the internal faults (DCavg>99%), either during the operation, or during the AUTOTEST.

Faults, detected only during the AUTOTEST, do not lead to loss the safety function thanks to the redundant internal design.

It ensures:

- a cross-monitoring of its internal operation
- a dynamic test of the overspeed function every 360 pulses of the encoder
- the control of validity of the memories

> Cut-off and safe connection of the System Fault and Overspeed outputs supply

The **SIDEOS One** system, that cuts off the supply of the System Fault and Overspeed outputs, is designed to switch off the output supply whatever the fault present on the output.

> Autotest

The Autotest triggers automatically at power on (time 1.5s) or at a manual starting-up (RESTART) following a triggering of a **SIDEOS One** output (time 1s).

The AUTOTEST allows a global checking and ensures the **SIDEOS One** to operate correctly, if the AUTOTEST is validated.

SPEED MONITORING - SIDEOS SC

Revision number: M10164-01-B

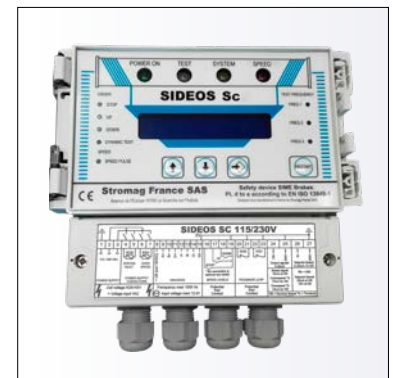
Revision date: 23.03.2021

For a detailed description of the **SIDEOS Sc** functionalities, consult the complete technical leaflet.

The **SIDEOS Sc** is a configurable system for speed monitoring designed to secure the lifting of a handling equipment. It compares the speed (encoder) with the speed controller setpoint. Its dimensions, operating conditions, electrical data and EC marking of conformity are identical to Sideos One.

> It is set according to:

- The lifting characteristics • Number of encoder pulses per revolution • Nominal speed of lifting in rpm • Deceleration time • Acceleration time	Parameters NC NS DT AT
- Parameterization of the monitoring • Number of validation pulses of a Static or Dynamic Slipping (2 to 10°) • Number of validation pulses of a underspeed / overspeed (10ms to 40ms at NS) • Underspeed and overspeed threshold in % of NS (10 to 25%) • Direction of rotation encoder (Dynamic Slipping)	VS1 VS2 DS DRe
- Parameterization of the signal output • Type of Signal on the signal output 0-20mA	OS



Access to the parameters is protected by a locking mode.

From:

- Functional commands transmitted to the speed controller
- From the speed setpoint transmitted to the speed controller
- Brake release signal (opening contact or controller control)
- The winch speed from an incremental encoder

> It monitors:	and detects, in case of wrong operation:
- the lifting speed - the lifting stop (deceleration) - the lifting stop positioning - the lifting operation direction - the encoder - the functional orders of the command - the output contactors or relays	- an Underspeed or an Overspeed - a Static Slipping (Deceleration fault) - a Static Slipping (Load slip) - a Dynamic Slipping - an Encoder fault - a Speed contact fault - a contactor fault

> When it detects a fault, it cuts:

- the power to the relevant output, System Fault or Overspeed

> It signals the triggering origin:

- via the alphanumeric display
- an auxiliary contact of the output contactors

> It secures the global operation of the speed monitoring system by means of:

- its redundant internal and external design and its monitoring system (DC > 99%) which allow the detection of all the internal and external failures.

> It records:

- The opening of the output contactors or relays and this even in case of power cut
- The 3 last Fault message

> It releases:

- the fault when the RESTART button is manually actuated, this action allows the control system to receive a distinct starting order.

**It allows to obtain
a secured speed monitoring system
Category 3 PL d up to Category 4 PL e
according to the standard NF EN ISO 13849-1.**

Safety systems

KINEMATIC CHAIN MONITORING - SIDEOS V4

Revision number: M10162-01-C

Revision date: 12.09.2019

- Configurable Monitoring System of the kinematic chain (SSCC) designed to secure the kinematic chain of a handling equipment (lifting).
- Independent monitoring system of the speed of a handling equipment (lifting).
- It drives the opening of the braking control circuit downstream of the control-command circuits which it depends on.
- It prevents or stops use of the lifting motion of the handling equipment, if it cannot perform its function.

Conform to the machine security standard:

ISO/IEC 13849-1

Category 4 Performance Level PL= e

Designed according to CRT16 60.C.016 EDF

- a single fault in any of its parts does not involve a loss of the safety function.
- a single fault is detected as soon as or before the safety function is next required.
- faults accumulation is taken into account.
- the average rate before failure of the **SIDEOS V4** subsystem is high: MTTFD = 172.4 years.
- the probability of dangerous failure per hour (1/h) of the **SIDEOS V4** subsystem is: PFHD = 1.35 10⁻⁸.
- the diagnosis coverage is high (DCavg ≥ 99%).
- the failures detection rate of Common Cause CCF ≥ 80%.
- the assignment time TM = 20 years

Operating conditions:

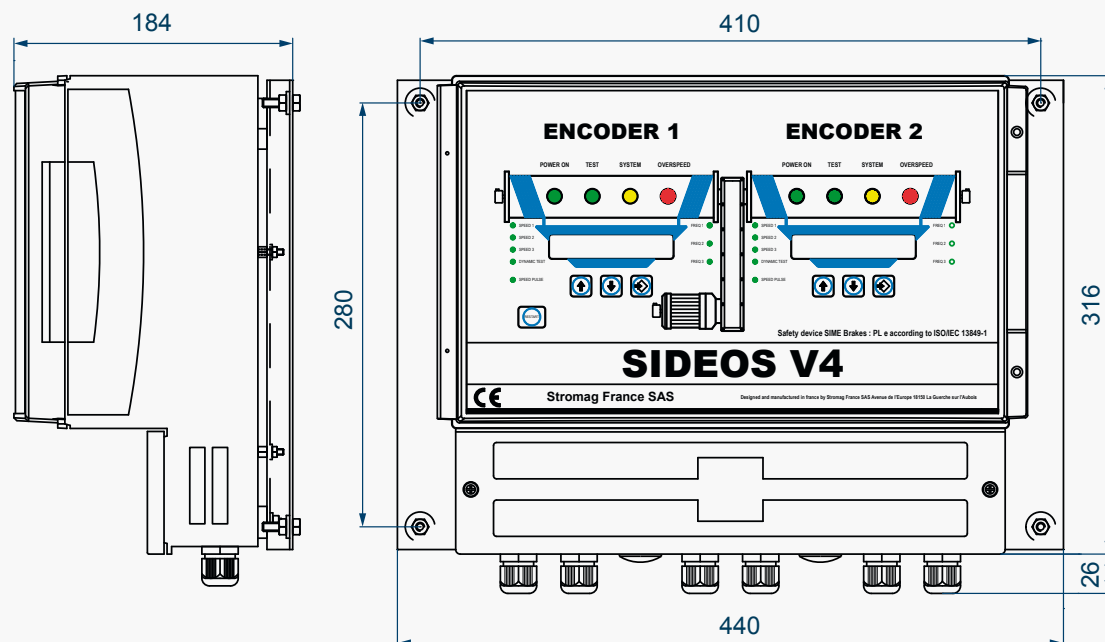
- Ambient temperature: -20°C to +60°C

Electrical data:

- DC: 24 VDC ± 15%
- Other voltages: consult us

EC marking of conformity:

- 2006/42/EC directive Machine
- 2014/35/UE Low voltage directive (standard NF EN 60204-1)
- 2014/30/UE EMC directive (standards NF EN 61000-6-2. NF EN 61000-6-4)



Casing material	Polycarbonate
Cables inputs	6 x cable glands ISO 20 (Ø cable min. = 6 mm / max. = 12 mm) 2 stopping plugs ISO 25
Casing protection rate	Casing IP65
Impact resistance	IK 08/07
Mounting	Screws M6 provided (Screw M6x20 – pin washers – nut M6).
Weight	8 Kg

MOUNTING INFORMATION

- > The metal support of the **SIDEOS V4** casing must be connected to the surrounding metal structure.
- > Use the provided screws to make the electrical and mechanical connection.
If necessary, use also a ground strape.

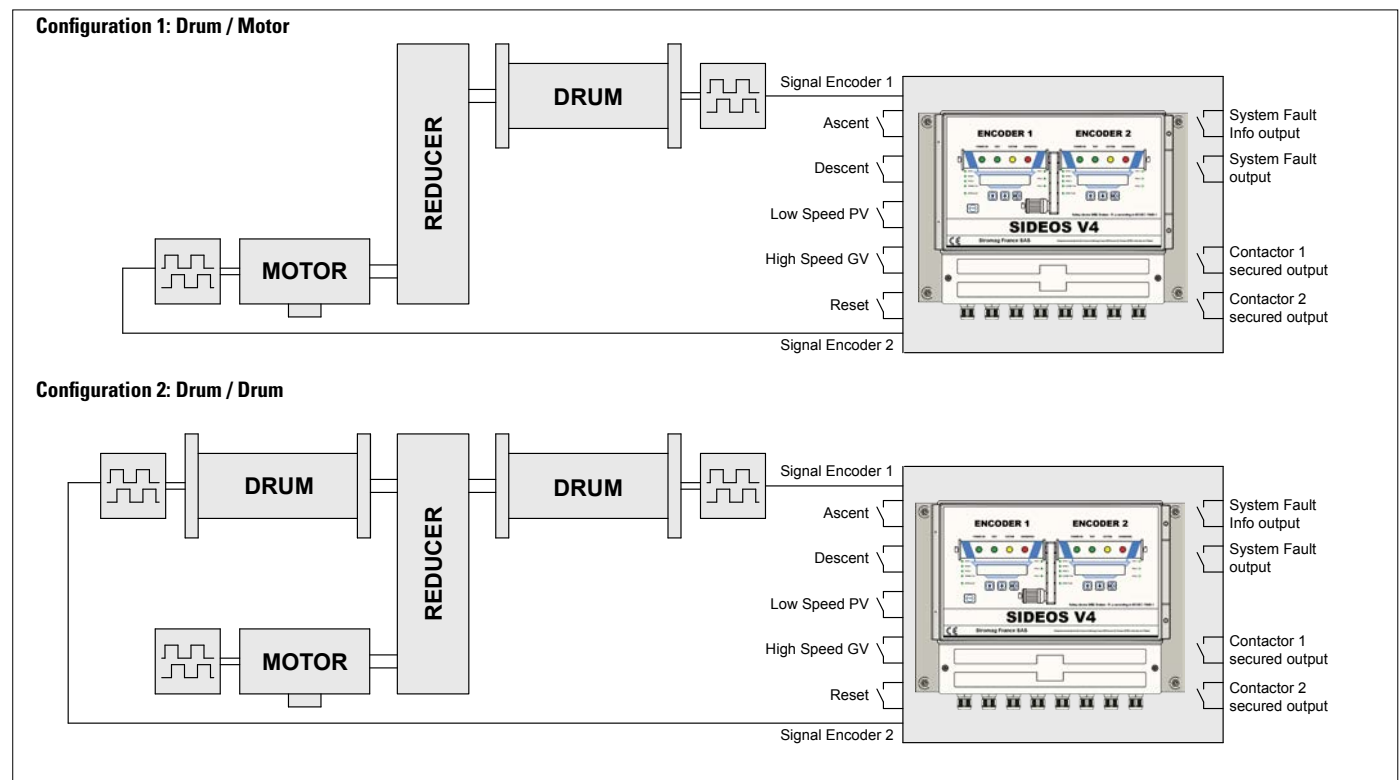
KINEMATIC CHAIN MONITORING - SIDEOS V4

Revision number: M10162-01-C

Revision date: 12.09.2019

For a detailed description of the **SIDEOS V4** functionalities, consult the complete technical leaflet.

SIDEOS V4



> It is set according to the lifting characteristics:

- Characteristics on Encoder N°1 side
- Characteristics on Encoder N°2 side

> It receives:

- the speed signals from the 2 incremental encoders
- the functional orders of the lifting control of the handling equipment
- the position of the brake control contactors via contacts NC mechanically linked to the power contacts.

> It monitors the lifting speed and detects the faults following the orders it receive:

- Faults of lifting speed.
 - Overspeed PV and GV – Kinematic chain breaking
 - Static Slipping – Dynamic Slipping
- External system faults
 - Encoders – Speed contact – Contactors.
- Internal system faults
 - Failure of the **SIDEOS V4** system.

> In case of Speed or System fault, it drives:

- the opening of the braking control circuit downstream the control-command circuits via 2 secured output contacts.

> It transmits to the control-command:

- the copy of the secured output contacts by making the difference between the opening due to a System fault or a Speed fault.

> It signals to the operator:

- the triggering origin via alphanumeric displays.

> It records:

- the opening of the output contacts even in case of a mains failure
- the 3 last fault messages.

> When powering on the **SIDEOS V4** or when a RESTART is requested (fault acknowledgment), it makes a complete AUTOTEST allowing:

- to test all the checking functions of the safety chain by simulating the System and Overspeed faults, without making a shunt,
- to detect all the internal failures ($DC_{avg} \geq 99\%$),
- the contacts closing when the AUTOTEST is validated.

Access to the parameters is protected by a password.

BRAKING SYSTEMS CONTROL AND MONITORING

SIGMA

Braking system control and monitoring



SIGMA systems offer tailor-made solutions to monitor and control complete braking systems to secure the installation in every cases (breakdown, failures, overspeed, etc...)

SIGMA cabinets include:

- Monitoring modules for each brakes assembly:
 - 1 **SIMAN** for braking control and HPU monitoring
 - 1 **SIBRAKE** for brake monitoring
- a PLC system, connected to each monitoring module for:
 - data display on local HMI
 - data transfer to the crane PLC
 - selection of the brakes in operation or on back-up mode
- a **SIDEOS** module for:
 - continuous monitoring of the drums speed through incremental encoders
 - sending a stop order to the **SIMAN** to close the brakes in case of fault as overspeed, differential speed or static slip
- a system for emergency controlled lowering of the load with:
 - 1 **SIREG** or **CRV** module per drum for drum speed management
 - 1 mobile box (wire connected) for safe operation
 - the drums can be operated separately (load tilting) or together (secured operation).

AFR5

Regulated braking control



AFR5 enclosures are tailor-made to monitor, secure and control the regulated braking of each installation whatever its configuration.

They enable:

- the brakes opening and closing (normal operation)
- the speed regulation for load lowering (regulated brake opening)
- the deceleration regulation (regulated brake closing)

They include modules:

- **SIDEOS** for speed monitoring
- **CRD™** for deceleration regulation
- **CRV™** for speed regulation

For safety level up to PLd

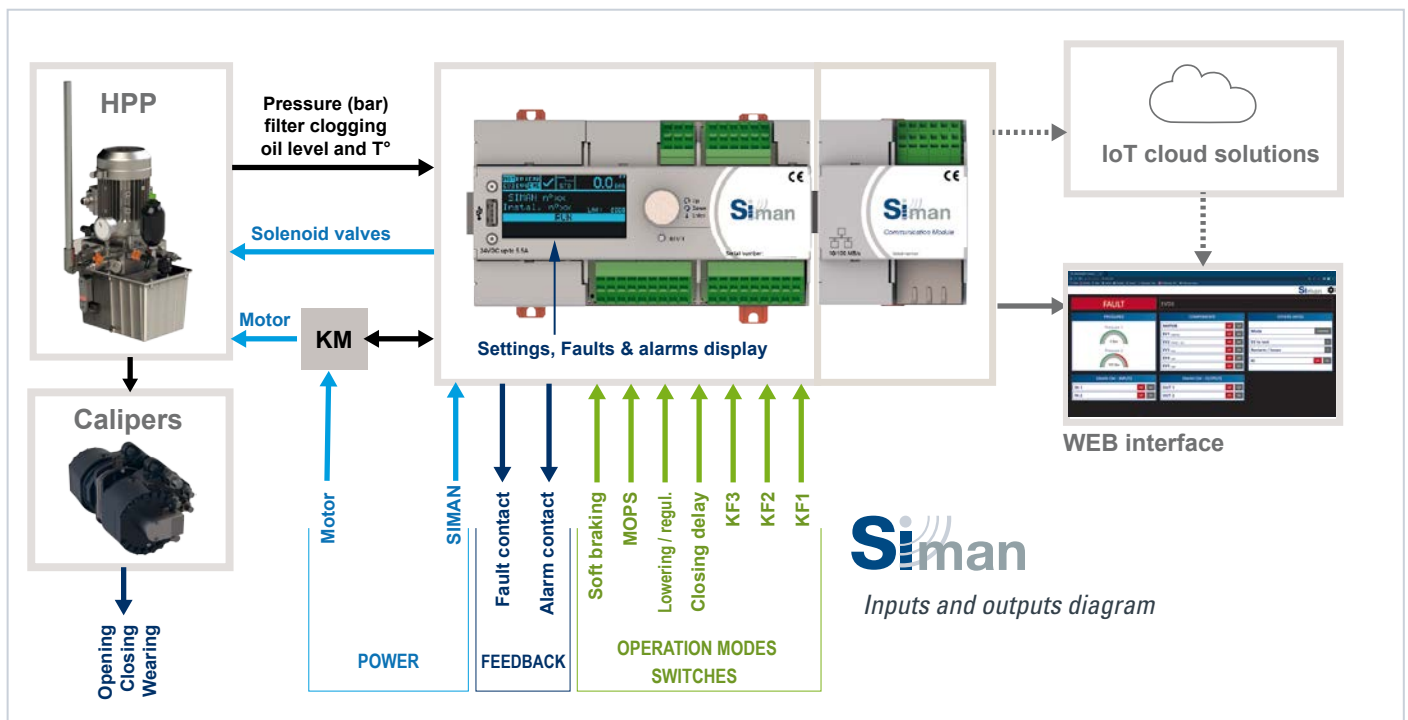
SIMAN

Safety Intelligent MANager

The **SIMAN** module is a Safety Intelligent Manager system for control and monitoring of the Hydraulic Power Packs.

The **SIMAN-CM** module (optional) enables the data communication via an Ethernet network for display to a control center or/and to the IIoT (Cloud Motion Connect) for predictive maintenance.

For safety level up to PLd category 2



SIBRAKE

Brake operation monitoring



The TDXB-SioT brakes are fitted with sensors, linear potentiometers and a SIBRAKE module for a complete monitoring of the brake operation.

The **SIBRAKE** module collects and processes the raw data into data that can be used for real-time monitoring of the brake and, if requested, for transmission to the IIoT for historical monitoring to allow predictive maintenance.

This module can also be used to monitor a set of two brakes (ex.: two TBXB, TB or SHD brakes) associated on the same disc, or a double-spring hydraulic brake (ex. SH brakes).

Safety systems

BRAKING CONTROL AND MONITORING - SIGMA

Revision number: M10227-01-A

Revision date: 12.02.2025

The **SIGMA** enclosure is designed to manage the crane emergency braking system. It allows 2 operation modes: normal and lowering.

Main characteristics

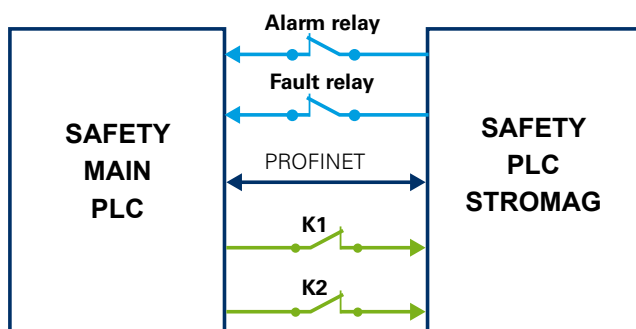
- > The **SIGMA** enclosure can:
 - Receive orders from the crane control-command operational system
 - Bypass the control system in case of emergency events (ex.: overspeed)
 - Manage the installation in case of components faults (ex.: failure of any sensor) to avoid interruption of operation and allow the maintenance team to act quickly on the equipment
 - Display on its HMI the type of the failure detected:
 - **Information: failure warning**
 - **Alert : Intervention of the maintenance team is needed**
 - **Fault : Complete stop of equipment, emergency brakes applied.**
 - Drives and monitors lowering operations via its mobile box.
- > It includes:
 - 1 HMI
 - 6 SIMAN + SIMAN COM modules for the 6 SHPU2 HPU management
 - 2 SIDEOS SP5 modules for the kinematic chain monitoring
 - 2 CRV modules for speed regulation during lowering operations
 - 1 Safety PLC Stromag, set to:
 - monitor the inputs and control the outputs
 - receive the control-command signals from the SIDEOS, SIMAN and the customer PLC
 - receive the functional orders of the mobile box during the lowering mode.
- > It communicates with the Safety Main PLC:
 - Communication feedback with the Crane Safety Main PLC is performed by PROFINET (Ethernet).
 - The Safety PLC Stromag receives the control-command signals from the Safety Main PLC by means of two safety relays (K1 and K2).
 - Two relays - one for alarms and one for faults management - are implemented in the enclosure. This setup enhances system reliability by distinguishing between alarm and fault signals and ensuring safe communication within the network.

Brakes configuration

- > SIGMA enclosure controls the activation sequences of each emergency brake according to a time set on the enclosure.
- > Each drum is fitted with a set of 3 brakes:
 - 2 brakes activated in standard mode
 - 1 brake activated in delayed mode
- > The same brakes of each drum are on standard mode
- > The third brake of each drum is on delay mode.
- > Every X days, the repartition: 2 brakes activated / 1 brake delayed is changed in the same way on the two drums.
- > The HMI displays the activated / delayed brakes.
- > In case of a blocking fault detected by a SIMAN (ex.: solenoid valve blocked) on an emergency brake, the installation will be secured by the system :
The user must change the activation sequences and will deactivate the delay mode of the third brake to prevent operation from being interrupted. The caliper of the faulty brake will remain open until the intervention of the maintenance team.
- > In the event that SIMAN or SIDEOS One SP5 detects an alert (ex.: oil leak) or a fault, which does not compromise the integrity of the braking system :
Safety PLC Stromag will receive this feedback and display the message (Information, Alarm or Fault) via the HMI indicating the cause of the problem, for example: which setpoint is not reached or which sensor is faulty.

Lowering control

- > Lowering operations are controlled from the Mobile Box which must be previously connected, for this use, to the braking system (Harting socket).
- > **SIGMA** enclosure manages the **CRV-R** module(s) in operation for regulation of the lowering speed.
- > Each drum is equipped with its own **CRV-R** lowering module. Each drum can be lowered separately (tilt situation or together).
- > **SIGMA** enclosure manages the failure of one encoder by means of the **SIDEOS One SP5** by inhibiting this one momentarily until the maintenance team resolves the problem.
- > In case of a problem with the two safety encoders, an alarm will be generated, and the operation will be stopped.

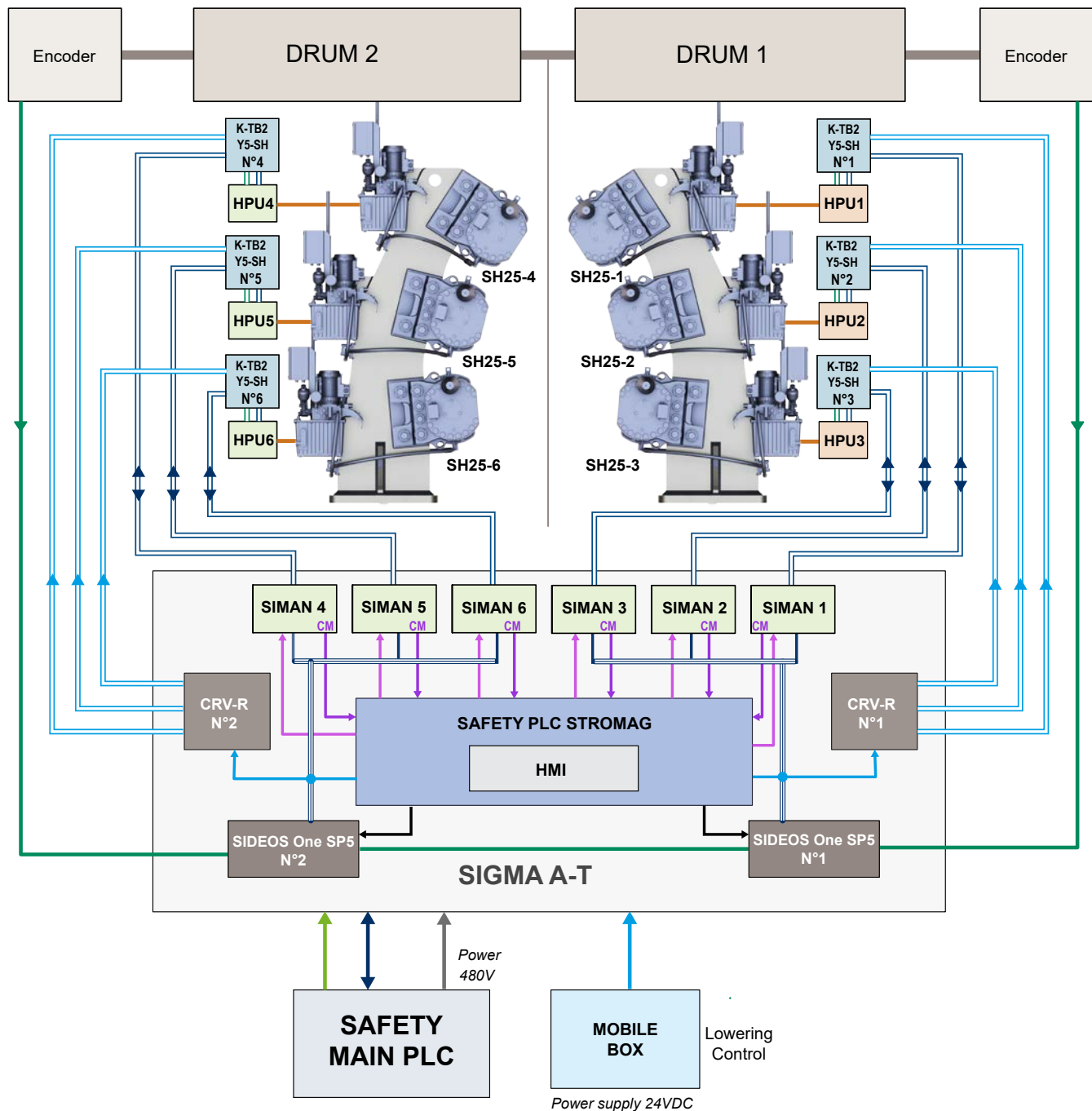


BRAKING CONTROL AND MONITORING - SIGMA

Revision number: M10227-01-A

Revision date: 12.02.2025

Operating diagram



SAFETY INTELLIGENT MANAGER - SIMAN

Revision number: T10163-02-B

Revision date: 28.07.2021

PRESENTATION

The **SIMAN** (Safety Intelligent MANager) is a hydraulic power unit safety manager (see **SHPU** leaflets quoted in bottom page), it allows to drive, monitor and securise:

- > Safety functionalities (**SIMAN SAFETY**):
 - Checking of braking possibility
 - Detection of locked solenoid valves
 - Overpressure detection in Lowering/Regulation mode
 - Internal faults detection
- > General functionalities (**SIMAN ADVANCED**):
 - Advanced braking functions (Delay, Lowering/Regulation, Soft Braking/Step Braking, MOPS)
 - Advanced diagnostics
 - Settings profiles (customizables)
 - Up to 2 separated hydraulic circuits
 - Up to 5 independent solenoid valves with possible eco mode
 - 5 assignable detection levels
 - Command problems detection
 - USB Data exchange (Languages/Settings/Records)
- > Operation monitoring (**SIMAN ADVANCED**):
 - Over/under pressure detection
 - 2 leakages detection levels
 - Hydraulic power unit sensors connections
 - Motor pump group protection
- > Options:
 - Inter-products communication (**SIoT**)
 - Multiple solenoid valves voltages (**MEVO** module)

NOTE

SAFETY configuration only allows to reach a safety level according to EN ISO 13849-1.

A **SIMAN** supplied with **ADVANCED** configuration allowing standard operation of most installations, does not provide a safety level according to EN ISO 13849-1.

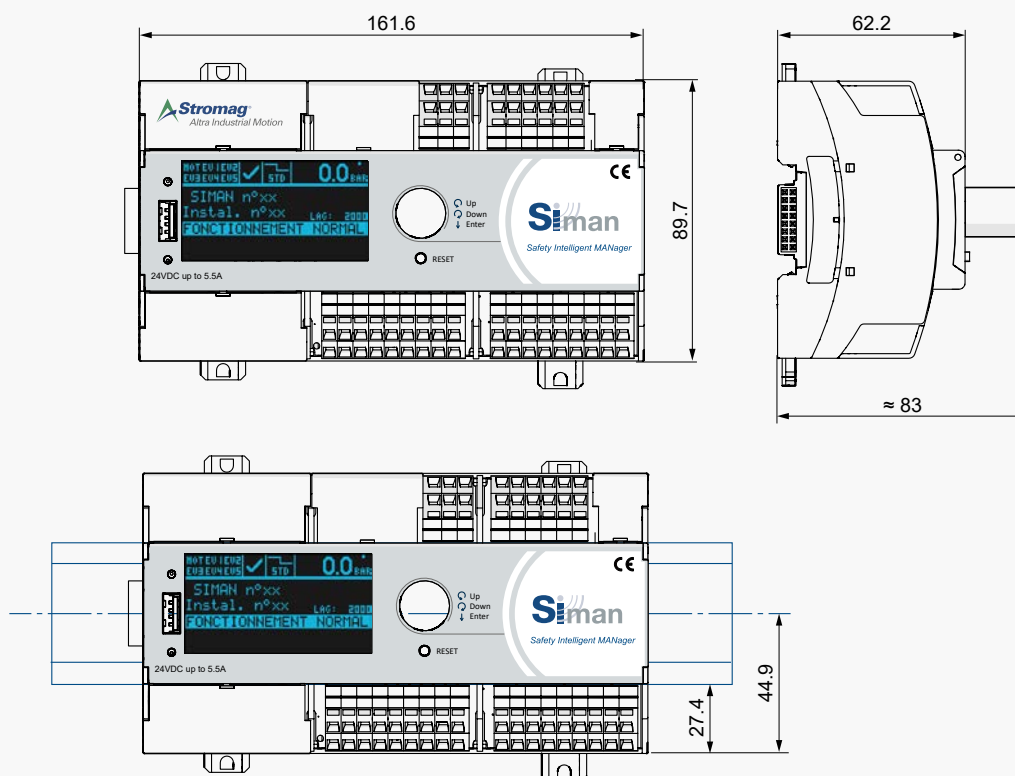
MECHANICAL FASTENING

The **SIMAN** must be mechanically mounted on a rail according to DIN 43880.

ELECTRICAL CONNECTIONS

All **SIMAN** electrical terminals have the following characteristics:

Conductor		section in mm ²
rigid	min	0,2
	max	2,5
flexible	min	0,2
	max	1,5
flexible with end without insulating inlet cone	min	0,25
	max	1,5
flexible with end with insulating inlet cone	min	0,25
	max	1,5
AWG conductor cross section	min	24
	max	14



SAFETY INTELLIGENT MANAGER - SIMAN

Revision number: T10163-02-B

Revision date: 28.07.2021

For a detailed description of the SIMAN functionalities, consult the complete technical leaflet.

SAFETY

Implementation

The machine manufacturer is responsible for the implementation. For installation, use and checks, it is recommended to take into account this document instructions and also the standards, prescriptions, national or international rules and directives that apply in particular:

Machinery directive 2006/42/EU

Low voltage directive 2014/35/EU

EMC Electromagnetic compatibility 2014/30/EU

Operation category according to EN ISO 13849-1

The **SIMAN** is a safety manager system for the HPP of the emergency braking system that acts directly on the dangerous phenomena that may occur in an unexpected way (crash risk due to a load fall), it is intended to be used in a part of the control circuit relating to safety (goods and people protection).

It allows to obtain a secured emergency braking control system of category 2 and a performance level PL=d according to the standard ISO/IEC 13849-1.

The control system of the **SIMAN** system faults allows to detect during operation all faults that may lead to the loss of safety function.

Safety data (according to EN ISO 13849-1)

Performance level	PL	PLd
Category	Cat.	Category 2
Mean Time To hazardous Failure	MTTFD	178 years
Average probability of dangerous failure per hour	PFHD	PFHD = 2,29 x 10 ⁻⁷
Mission duration	TM	20 years
Stop category		Mechanical type 0
Calculation	PFHD	500 000 operations / year (1369 / day)

HUMAN / MACHINE INTERFACE

The **SIMAN** has a man/machine interface fitted with a screen, an encoding wheel for navigation in the various menus, a USB port as well as a RESET button for resetting the system.

Encoding wheel

The encoding wheel allows navigation in the different menus and sub-menus of **SIMAN**.

Pressing it once allows validation, pressing it for an extended time allows access to the advanced functions, turning it anti-clockwise allows going up, and turning it clockwise allows going down.

USB port

The USB port of **SIMAN** allows several functionalities: importing language files, recording the operation of the hydraulic braking system on the installation as well as importing/exporting a configuration.

Screen

Events description:

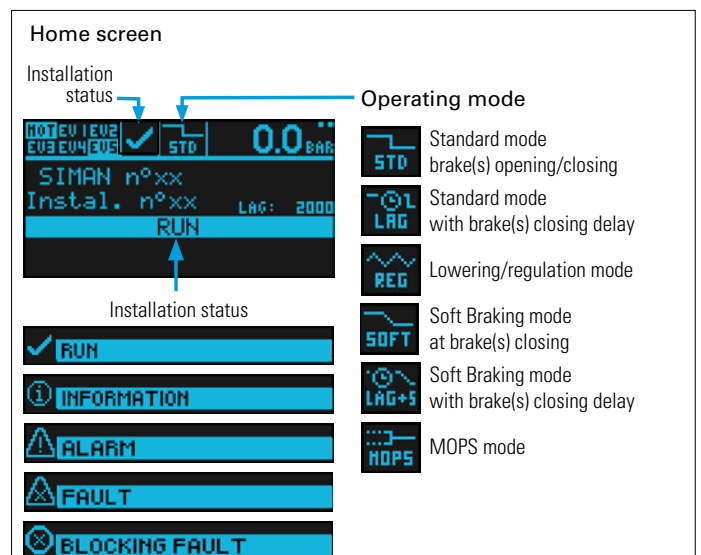
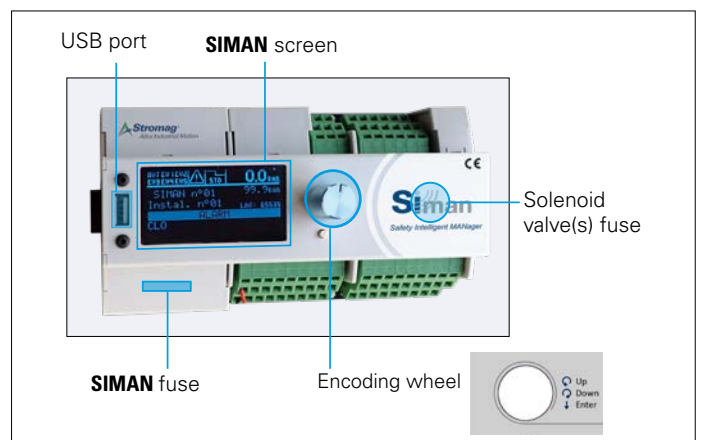


Screen - Detection description
For more details on the current event, press briefly on the encoding wheel.

Events history

A history of the last hundred events containing all the detections is available under:

MAIN MENU → EVENT HISTORY →



COMMUNICATION MODULE - SIMAN CM

Revision number: M10163-03-A

Revision date: 13.12.2021

PRESENTATION

The **SIMAN CM** (SIMAN Communication Module) is an optional module for the SIMAN (Safety Intelligent MANager) allowing its connection to an Ethernet network.

Features:

- > ModBus TCP Server (Slave)
- > WEB server including :
 - SIMAN dashboard
 - SIMAN CM administration

NOTE !

The **SIMAN CM**, by its design, can only read information contained in a SIMAN. It cannot modify the SIMAN's parameters or impact its operation.

Thus, the **SIMAN CM** has no security impact on the SIMAN.

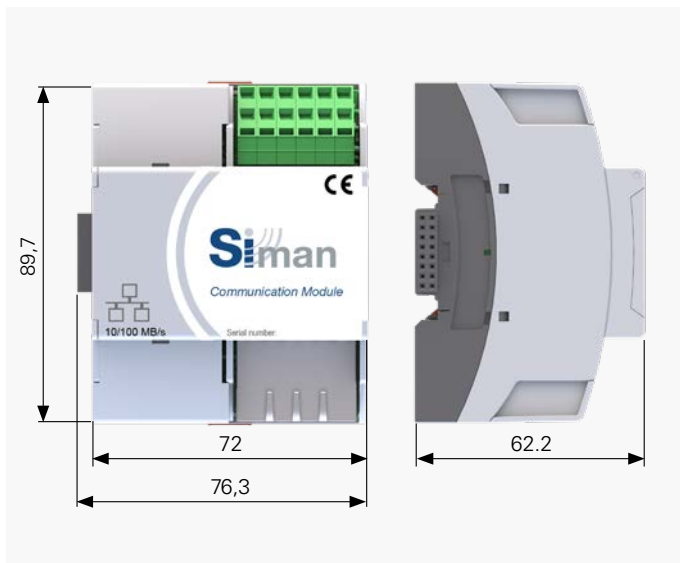
DANGER !

Safety depends directly on the configuration of the SIMAN. In order to ensure maximum safety, it must be adapted to the installation.

Before use, make sure that the SIMAN leaflet (see reference below) is taken into account by a qualified person in the fields of electronics/electrics, hydraulics and mechanics.

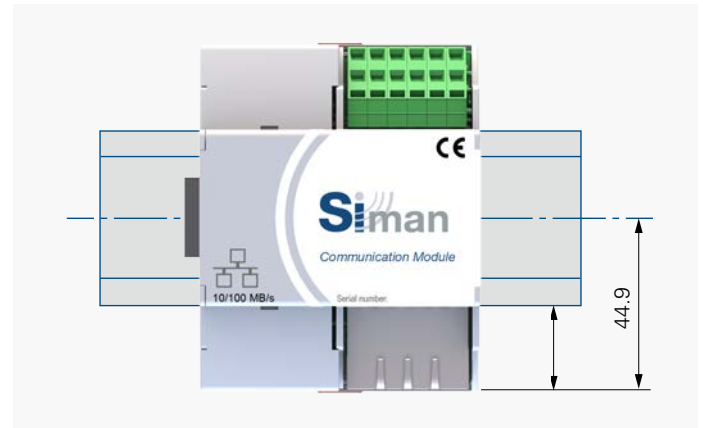
TECHNICAL CHARACTERISTICS

Dimensions



Mechanical mounting

The **SIMAN CM** must be mechanically mounted on a rail according to DIN 43880.



Electrical connections

All the terminals for the **SIMAN CM** electrical connections have the following characteristics:

Conductor		section in mm²
rigid	min	0,2
	max	2,5
flexible	min	0,2
	max	1,5
flexible with ferrule	min	0,25
	max	1,5
flexible with ferrule and insulating entry cone	min	0,25
	max	1,5
Conductor section AWG	min	24
	max	14

Arrangement of connection terminals:

	2	4	6	8	10	12
	1	3	5	7	9	11
SIMAN CM						
	ETH 1			ETH 2		
1 – Output 24V	7 – RL1 NO			ETH1 – Ethernet port 1		
2 – 0V	8 – RL2 NO			ETH1 – Ethernet port 2		
3 – IN 1	9 – RL1 C					
4 – IN 2	10 – RL2 C					
5 – Output 24V	11 – RL1 NC					
6 – 0V	12 – RL2 NC					

The two Ethernet ports form an internal switch and are on the same network. They can, for example, be used to perform a "chaining".

COMMUNICATION MODULE - SIMAN CM

Revision number: M10163-03-A

Revision date: 13.12.2021

CONNECTION to SIMAN and POWER SUPPLY

The **SIMAN CM** must be connected to one and only one SIMAN via the DIN rail backplane connectors supplied with the **SIMAN CM**. This connection allows both the power supply of the **SIMAN CM** and the collection of information from the SIMAN.



INPUTS / OUTPUTS

The **SIMAN CM** has two 24V discrete inputs and two relay outputs. These are configurable via the WEB interface and can be read and controlled via ModBus TCP. They are independent of the SIMAN.

WEB INTERFACE

The **SIMAN CM** has a WEB interface allowing the visualization of the information coming from the SIMAN as well as the configuration of the **SIMAN CM**.

The **SIMAN CM** is configured by default with the following IP address: 192.168.1.250/24.

In order to integrate the **SIMAN CM** in a network, it is necessary to modify this configuration via the WEB interface.

ModBus TCP

The **SIMAN CM** includes a ModBus TCP server (Slave). The slave address is set to the value 1.

The server consists of 5 sockets allowing up to 5 simultaneous connections. These sockets all use port 502 by default. The port used can be changed independently for each socket via the WEB interface (a port set to the value 0 disables the socket).

For a detailed description of the SIMAN CM functionalities, consult the complete technical leaflet.

For control, monitoring and safety functions, SHPU2 and SHPU3 Hydraulic Power Packs can be equipped with a **K-SI** electrical unit. This electrical unit includes a **SIMAN** (Safety Intelligent MANager) and optionally :

- 1 power supply 24VDC 5A or 10A
- 1 **SIMAN CM** (**SIMAN** Communication Module) allowing the connection of the SIMAN to an Ethernet network
- 1 **MEVO-5RL** allowing the use of solenoid valve coils other than 24VDC, consult us.

Its operation and characteristics directly depend on the **SIMAN**.



K-SI CM MEVO

Safety systems

BRAKES MONITORING - SIBRAKE

Revision number: T10211-01-B

Revision date: 27.06.2023

Brake data recorder module

The **SIBRAKE** module collects and processes the raw data of the sensors (dynamo-metric axes, linear potentiometers, limit switches, etc...) into data that can be used for real-time monitoring of the brake and, if requested, for transmission to the IIoT for historical monitoring.

One **SIBRAKE** module can also be used to monitor a set of two brakes (ex.: two TBXB, TB or SHD brakes) associated on the same disc, or a double-spring hydraulic brake (ex. SH brakes)

Connections :

- M12 connectors
- Connection on one face (standard) or on two faces (optional) (A + B sides)
- With the two faces option: possibility to chain several modules (SIBRAKE, SIMAN, ...etc)
- Basic network functions (ping, NTP, ...)
 - WEB Server + WEB API
 - ModBUS TCP Server
 - IoT functions (Cloud Motion Connect)

Operating conditions :

- IP65 protection
- Operation from -20°C to +70°C
- Relative humidity <95%
- Lifetime: minimum 10 years

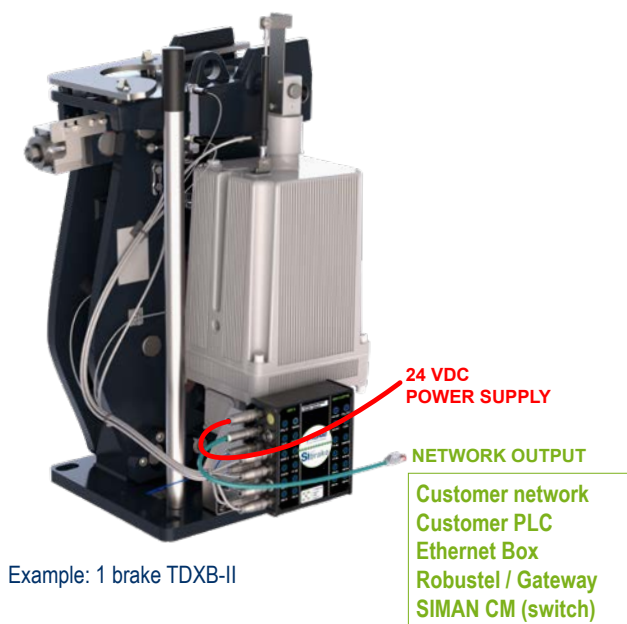
Electrical data :

- Ethernet 10/100 BASE-T
- Ethernet switch function (with 2 sides)
- 24V DC power supply +/- 15%
- Analog inputs 0-10 V, 4-20 mA
- Analog inputs can be used as digital inputs

EC marking of conformity :

- 2006/42/EC directive Machine
- 2006/95/EC Low voltage directive (standard NF EN 60204-1)
- 2004/108/EC EMC directive (standards NF EN 61000-6-2, NF EN 61000-6-4)

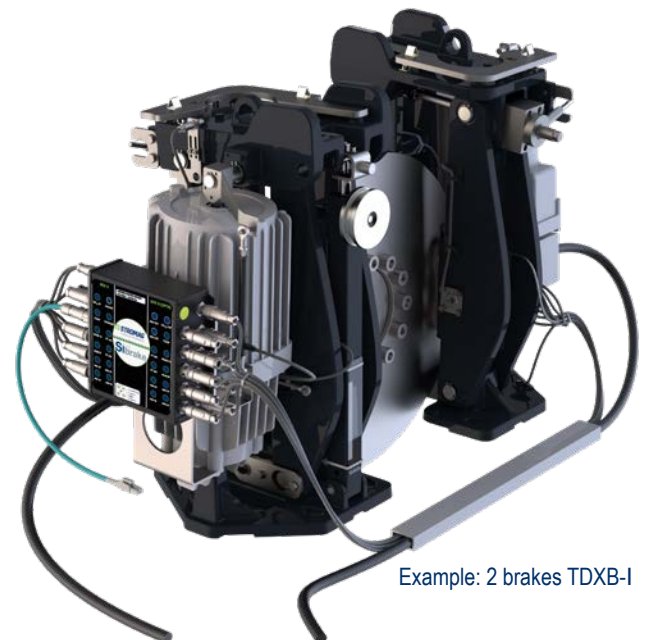
Association with 1 TDXB brake



STANDARD SIDE
M12 connectors



Association with 2 TDXB brakes



STANDARD SIDE A
M12 connectors

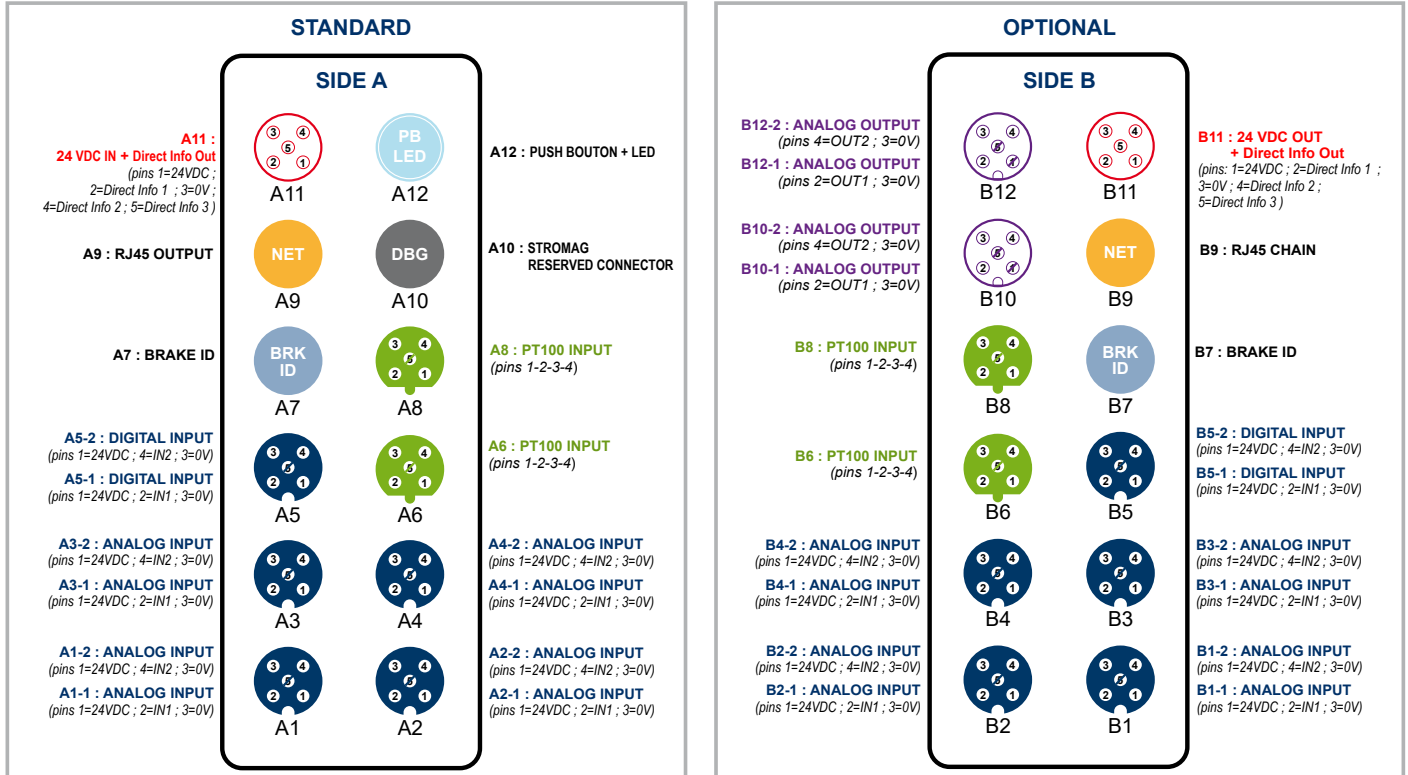


OPTIONAL SIDE B
M12 connectors

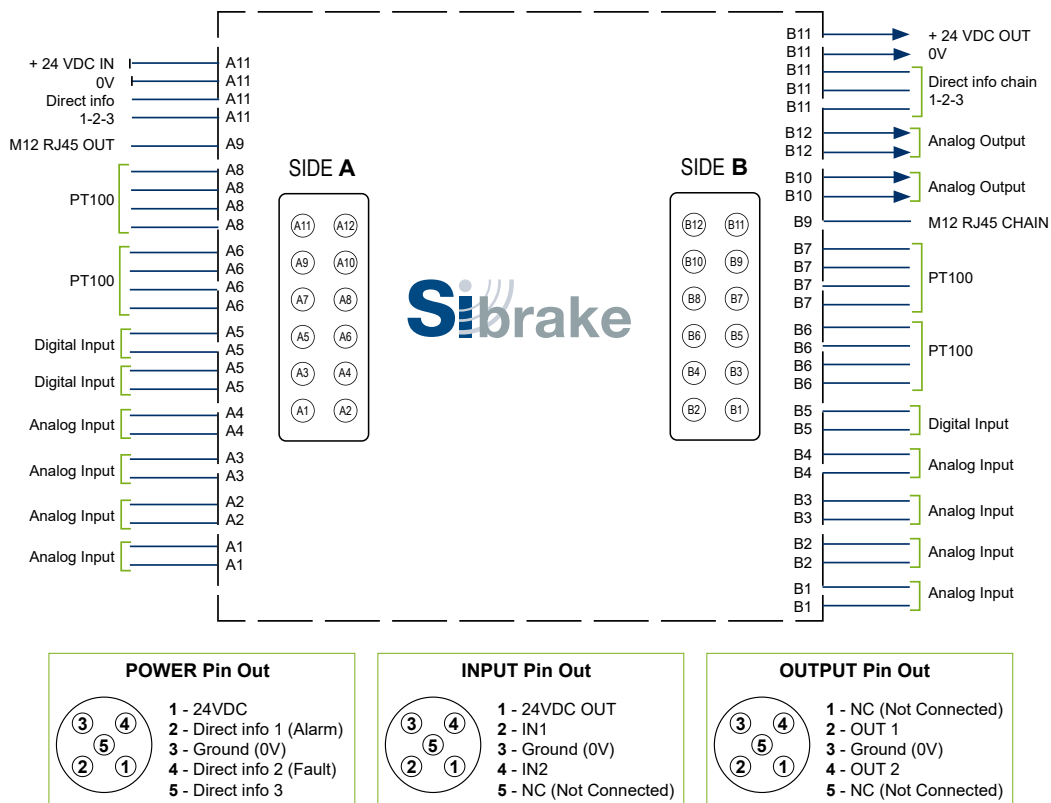
BRAKES MONITORING - SIBRAKE

Revision number: T10211-01-B

Revision date: 27.06.2023



Wiring diagram



Safety systems

REGULATED BRAKING CONTROL - AFR5 ENCLOSURES

Revision number: M10105-01-E

Revision date: 25.07.2016

AFR5 control enclosures are designed for controlling and monitoring regulated braking systems. They are custom designed to meet the exact needs of the installation.

They allow different braking modes:

- Constant deceleration (**CRD®** module)
ex.: Cableway: Pic du Midi (Bagnères de Bigorre)
- Constant deceleration and speed regulation (**CRD®** module)
ex.: Passengers elevator: Eiffel Tower in Paris
- Normal operation (AoN) and speed regulation for load lowering (**CRV®** module)
ex.: Steel industry ladle crane

They can be designed to ensure a safety performance level up to PL d to the braking system.

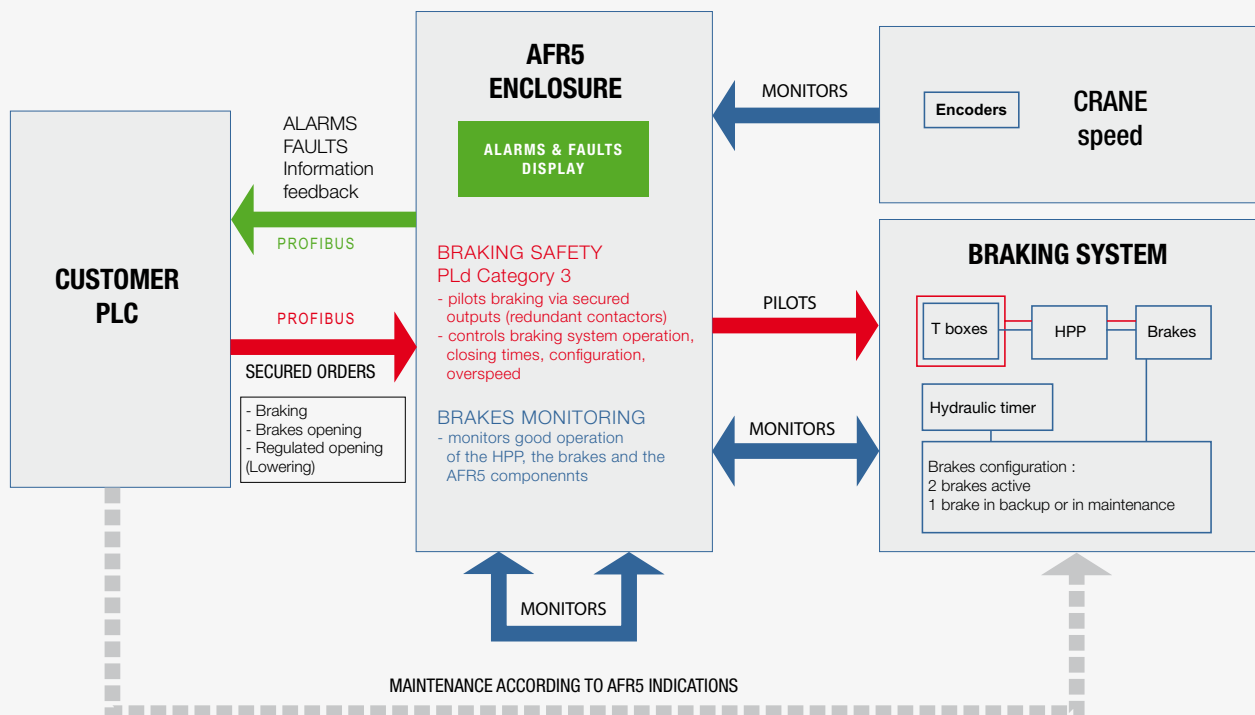
They can include:

- an Ethernet line towards the customer PLC,
- the braking management in case of power supply loss or regulated braking fault,
- the speed monitoring (**SIDEOS One**),
- the control of standby brakes or/and Hydraulic Power Packs to ensure the operation continuity in case of failure of one part of the braking system,
- a Human Machine Interface or Module.

Here is, for example, the diagram of the AFR5-enclosure with:
All or Nothing braking - Load lowering - Performance level PLd - Standby brakes - Data transmission to the customer PLC via ProFibus and secured ProFiBus.



AFR5 enclosure principle

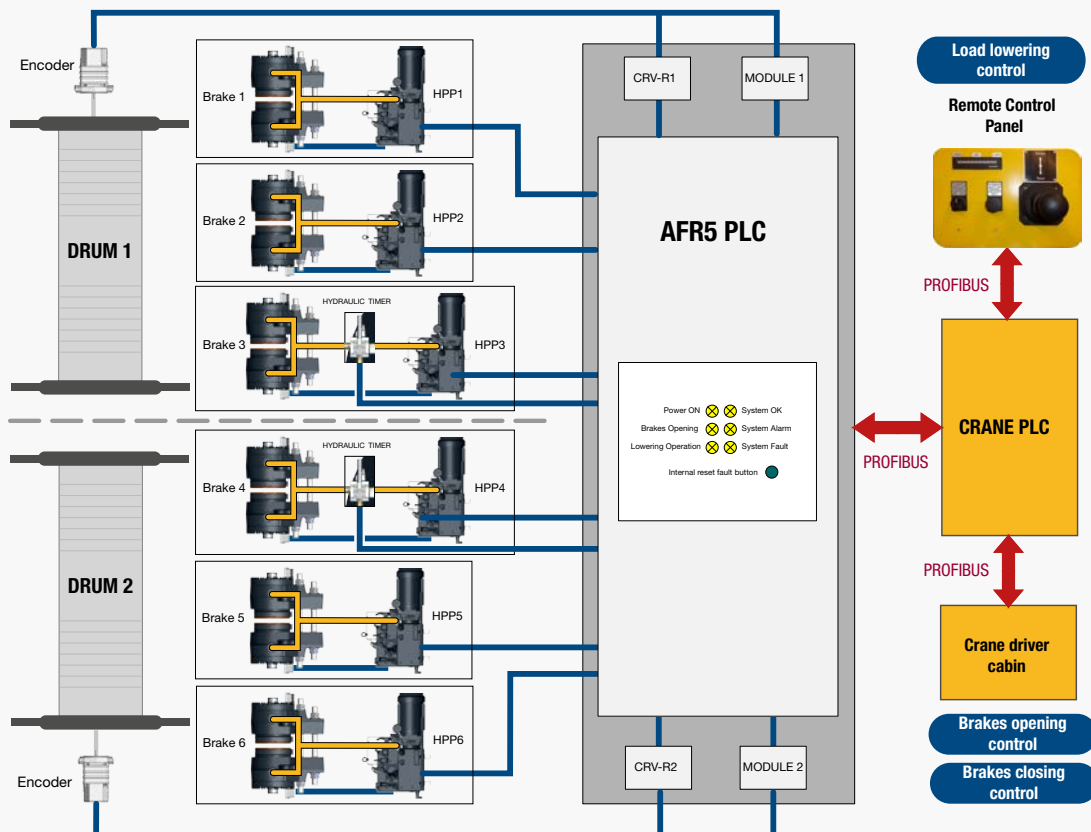
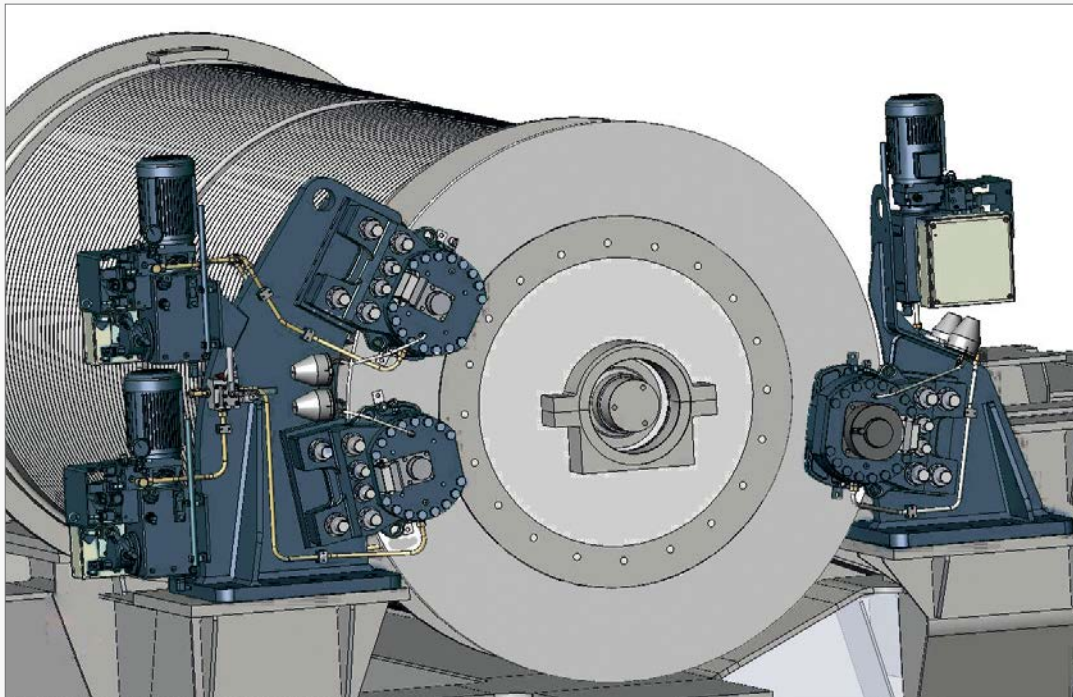


REGULATED BRAKING CONTROL - AFR5 ENCLOSURES

Revision number: M10105-01-E

Revision date: 25.07.2016

Braking System monitored and controlled by AFR5 enclosure



Safety systems

CONSTANT DECELERATION - CRD MODULE

Revision number: M08950-01-C

Revision date: 03.06.2015

For a detailed description of the CRD module features, consult the complete technical leaflet.

PRESENTATION

The **CRD®** module, combined with **5KE. 650E. TY5. TH** and **SH** type brakes allows a constant deceleration regulated braking whatever the speed, the load and the kind of load, driving or resisting.

CRD board(s) are in a separate control unit or they are integrated in a control enclosure.

Applications: cableways, chairlifts, funiculars, lifts, belt conveyors, transporters ...

PRINCIPLE

CRD system consists of:

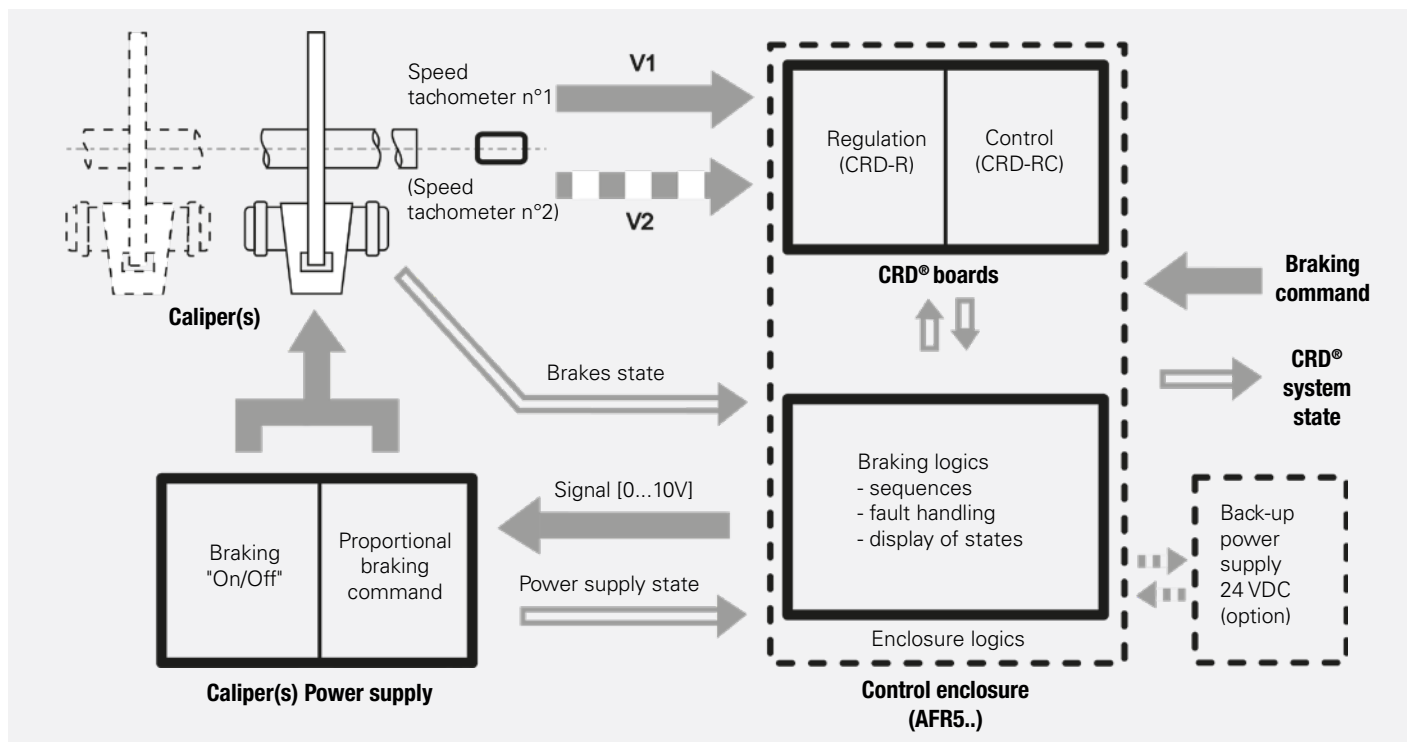
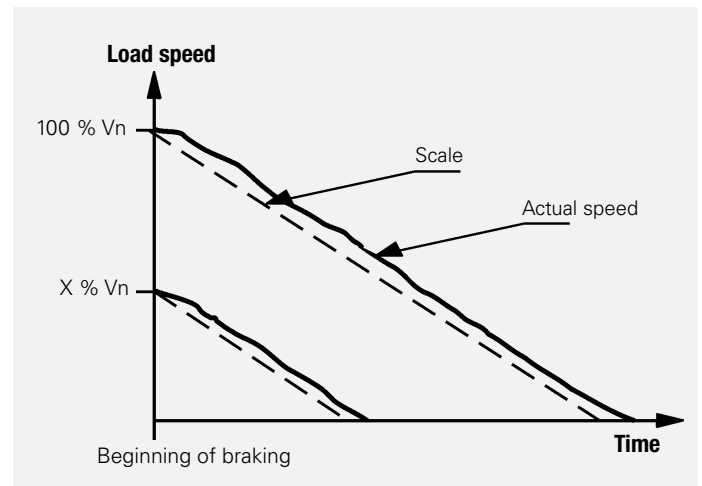
- 1 or more brakes (progressive brakes type **5KE. 650E. TY5. TH** and **SH**).
- 1 hydraulic pack or 1 electric power supply.
- 1 (or more) speed sensors (tachometric dynamo..).
- 1 **CRD®** module, it may be integrated into an **AFR5** enclosure supplied by Stromag™.

Two **CRD** versions exist:

- **CRD-R**: a deceleration regulation board monitors power units or an electronic amplifier for a proportional pressure limiter of an hydraulic power unit, customer supply the reference speed signal.
- **CRD-RC**: to the regulation board is connected a deceleration control board, fully independant from the regulation board (power supply, speed signal, scale and command).

Lowering

CRD module provides lowering function (load is let down on command after a full successful braking, for security purpose) to X % of nominal speed (setting between 5 and 20%), at constant speed, or at variable speed (operator controlled auto "0" recentering joystick).



SPEED REGULATION - CRV MODULE

Revision number: M08955-01-B

Revision date: 03.06.2015

For a detailed description of the CRV module features, consult the complete technical leaflet.

PRESENTATION

Speed regulation with **CRV®**, in combination with brakes type **5KE**, **650E**, **TY5**, **TH** and **SH**, provides a regulated speed braking whatever the load quantity and load specificity, pulling or resisting.

CRV board(s) are in a separate control unit or they are integrated in a control enclosure.

Use: lowering, speed regulation.

Applications: cableways, chairlifts, funiculars, lifts, belt conveyors, transporters, cranes, etc...

PRINCIPLE

CRV system consists of:

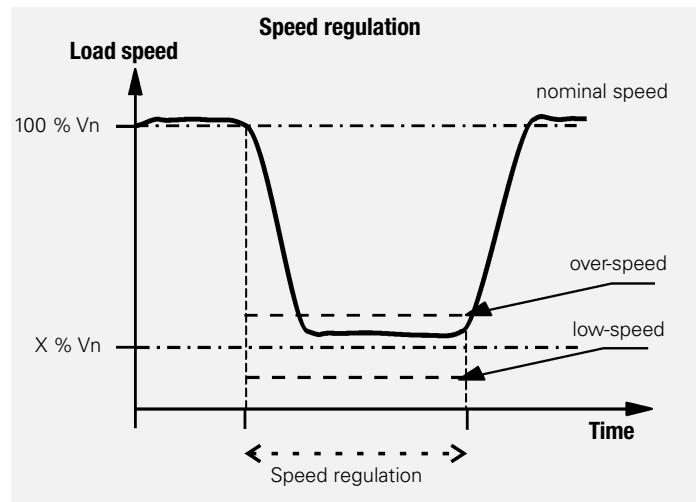
- 1 or more brakes (progressive brakes type **5KE**, **650E**, **TY5**, **TH** and **SH**);
- 1 hydraulic pack or 1 electric power supply
- 1 (or more) speed sensors (tachometric dynamo..).
- 1 **CRV** module, it may be integrated into an **AFR5** enclosure supplied by Stromag™.

Two **CRV** versions exist:

- **CRV-R**: a speed regulation board monitors power units or an electronic amplifier for a proportional pressure limiter of an hydraulic power unit, customer supply the reference speed signal.
- **CRV-RC**: to the regulation board is connected a speed control board, fully independent from the regulation board (power supply, speed signal, scale and command).

Lowering

CRV module allows choosing a lowering (regulated load lowering after stop, for security purpose) at X % of nominal speed, (setting between 5 and 20%), at constant speed, or at variable speed (potentiometer with automatic "0" restoring adjusted by operator).

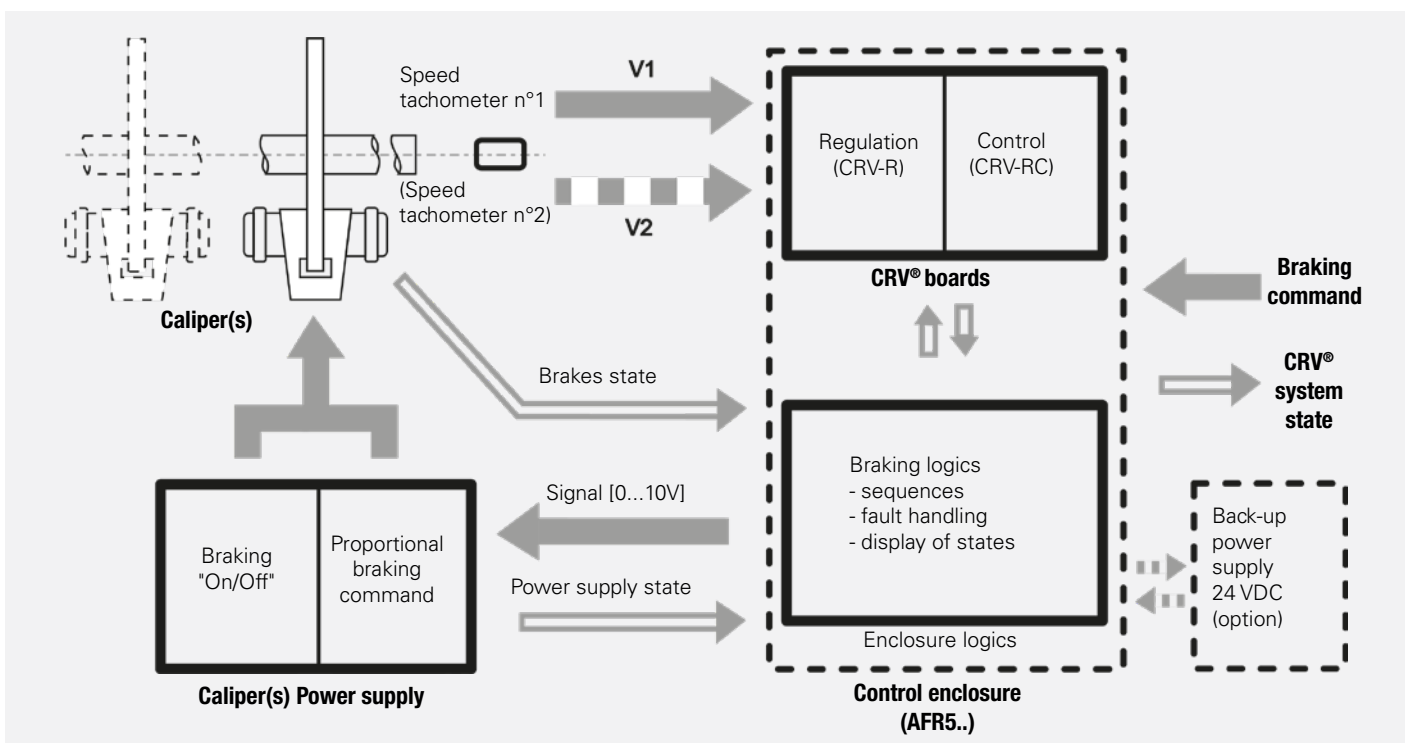


Speed regulation

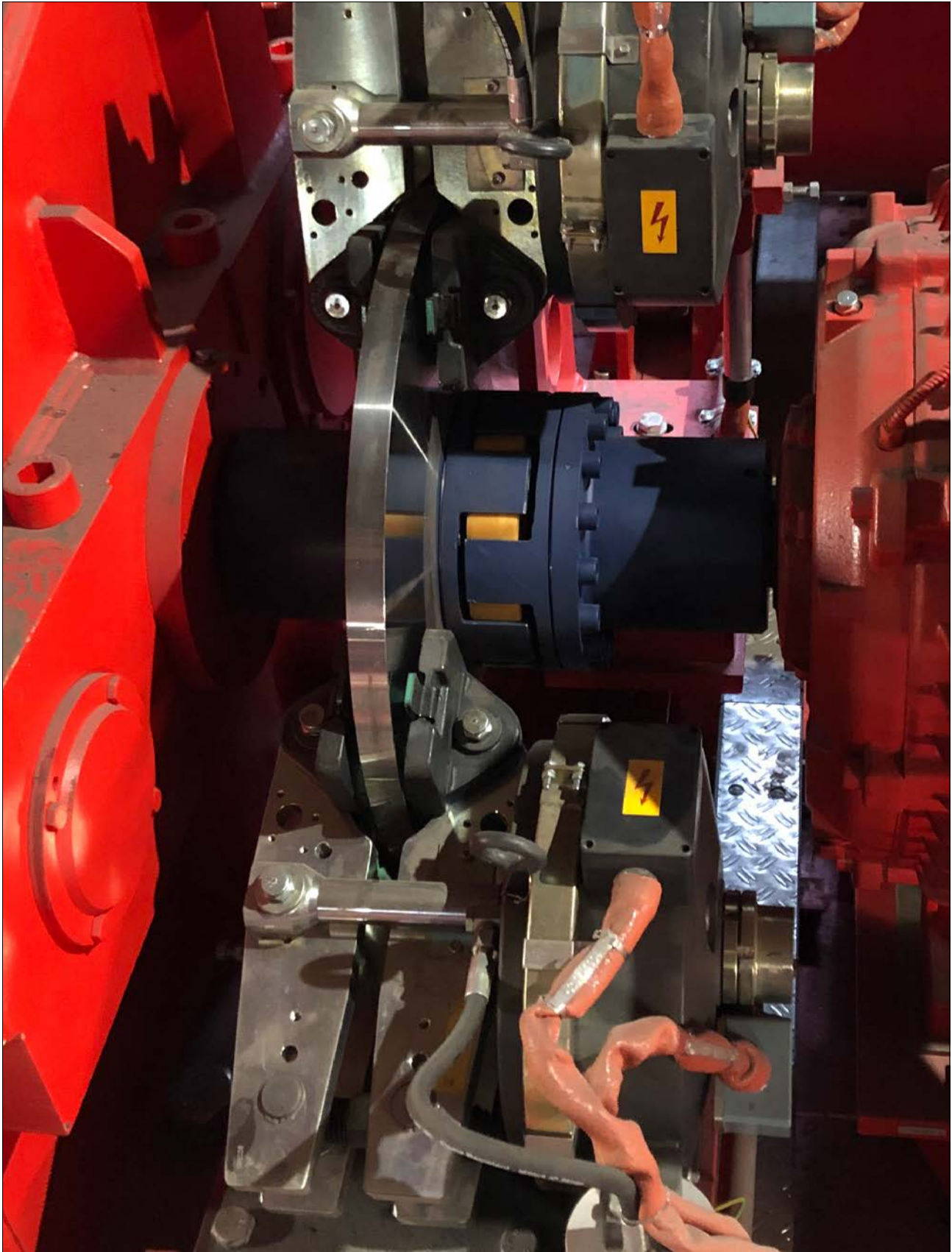
CRV module allows a speed regulation set at X% of nominal speed (constant speed, factory set between 5 and 100% of nominal speed), failure of a speed sensor or damaged wires).

Speed control (CRV-RC only)

Using an additional speed sensor connected to "speed control" board allows a monitoring of the regulation (detected anomalies: speed too high or too low, mechanical breakdown of shafts or gearbox, speed sensor anomaly or damaged wiring).



DISCS & COUPLINGS



MAIN CHARACTERISTICS	OPTIONS
• MONOBLOC, SOLID AND VENTILATED DISCS • 3 TYPES OF DISC COUPLINGS • A COMPLETE RANGE OF ELASTIC COUPLINGS	• DISC COUPLINGS WITH: - LONG HUB ON MOTOR SIDE - LONG HUB ON GEAR BOX SIDE - LONG HUBS ON THE TWO SIDES

DISCS



MONOBLOC DISCS



SOLID DISCS

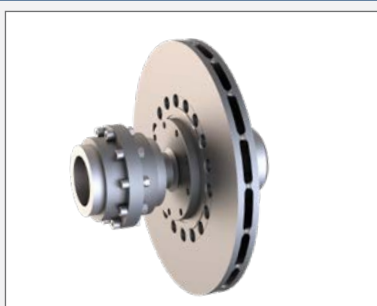


AUTO-VENTILATED DISCS

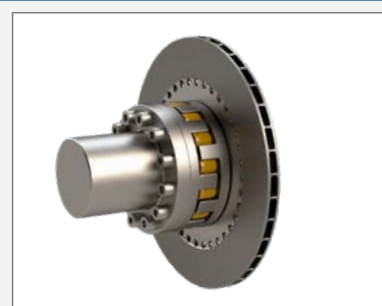
DISC COUPLINGS



PERIFLEX®
TIRE FLEXIBLE DISC COUPLINGS



MTDF
GEAR DISC COUPLINGS



E - SVKL - SDKL
ELASTIC DISC COUPLINGS

COUPLINGS

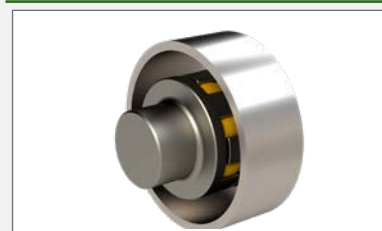


SVW - SDW
ELASTIC COUPLINGS
(with 2 claw-hubs)



SVR - SDR
ELASTIC COUPLINGS
(with 2 claw-rings)

DRUM COUPLINGS



SVT - SDT / PB-C
ELASTIC DRUM COUPLINGS
(with rubber ring (SVT) / bushes (PB-T))

Discs and couplings

DISCS - GENERAL CHARACTERISTICS

Revision number: T08020-01-F

Revision date: 27.07.2017

DISCS OF BRAKES CHARACTERISTICS

1 - Dimensions

Refer to leaflets "Technical data and dimensions" relevant to the type of disc used.

For a new disc, the tolerance of the thickness dimension is:

$$\pm 0.15$$

2 - Materials

Ventilated discs: Cast iron type EN-GJS-400-18-LT ou EN-GJS-350-22

Solid discs: Steel S355 K2

Hubs: Steel 25/34/42CrMo4

3 - Surface quality of the contact zone with lining (table 1)

Friction surface: Ra 1.6 to 3.2 in all directions

Centring zone: Idem

4 - Balancing

Only bare discs (except monoblocs).

Discs are balanced in "static" quality G6.3:

- at the speed of 1800 rpm for discs $\varnothing \leq 550$ mm.
- at the maximum speed indicated in the "technical data" leaflets for discs $\varnothing > 550$ mm

The correction area is placed between the hub and the little diameter of the friction surface (see table 1).

For balancing with hub, with half-coupling or at high speed, consult us.

Table 1 - Dimensions of the friction surface

EXTERNAL DIAMETER	INNER DIAMETER				
	Thickness 15	Thickness 30			Thickness 42
	Monobloc disc	Monobloc disc	Ventilated disc	Solid disc	Ventilated disc
175	85	---	---	---	---
220	105	90	---	---	---
260	132	136	---	---	---
315	130	180	165	130	---
355	---	---	206	155	---
395	157	---	246	246	---
445	207	---	216	185	---
495	300	---	256	256	---
550	350	---	325	314	---
625	430	---	387	387	370
705	---	---	462	462	---
795	---	---	542	542	542
995	---	---	---	600	745

DISCS - GENERAL CHARACTERISTICS

Revision number: T08020-01-F

Revision date: 27.07.2017

5 - Wear limit before the replacement of the disc

DANGER !

In case of an excessive wear of the disc the brake can operate out of its nominal range of setting and consequently lead to a loss of braking force.



The table 2 sums up the discs minimum thicknesses as before their replacement.

Table 2

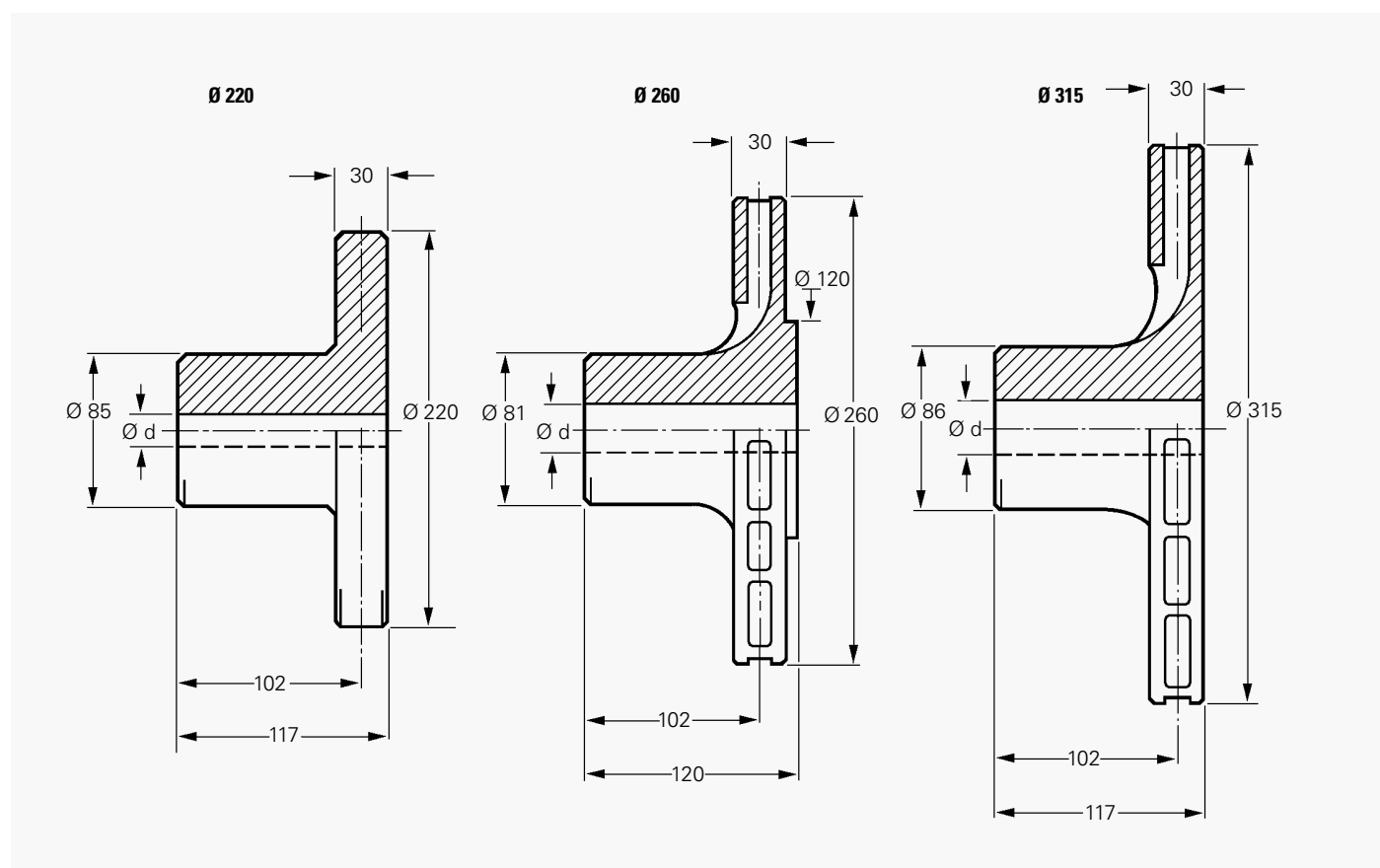
Type of disc	Thickness unused (± 0.15) mm	Minimum thickness before replacement mm	Minimum web before replacement mm
Monobloc discs	30	27	6.5
Ventilated discs	30	27	6
	42	39	with core of 16: 11 with core of 23: 8
Solid discs	15	13	
	30	27	
	42	39	

DISCS - MONOBLOC DISCS

Revision number: T02160-01-B

Revision date: 02.04.2025

Diametres: 220. 260 and 315 mm.
Thickness: 30 mm.



Designation		Ø	220 M 30	260 M 30	315 M30
J		kg/m²	0.055	0.070	0.14
Weight		kg	11.2	10	12
Maximum speed		rpm	4300	3600	3000
d max.	keyed	mm	55	55	60
	shrink fit	mm	55	55	60

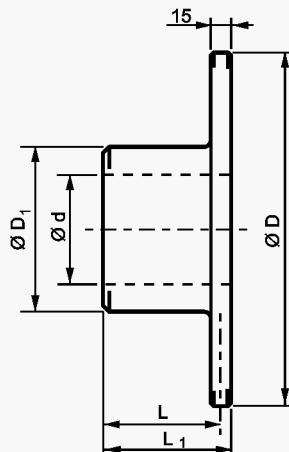
DISCS - SOLID DISCS

Revision number: T02100-01-A

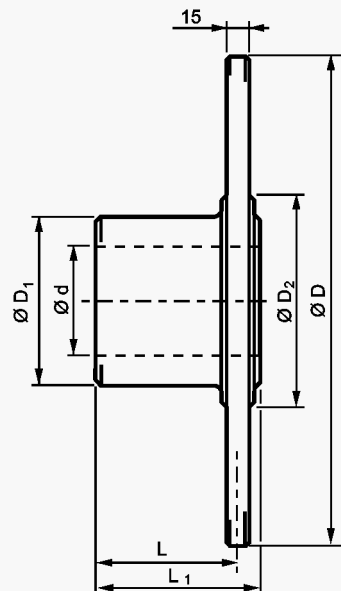
Revision date: 01.03.2001

Thickness: 15 mm

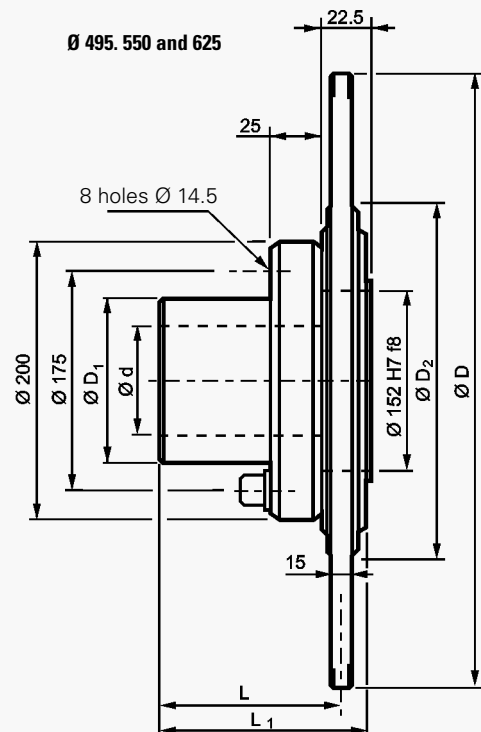
Ø 175. 220 and 260



Ø 315. 395 and 445



Ø 495. 550 and 625



Designation		175 P 15	220 P 15	260 P 15	315 P 15	395 P 15	445 P 15	495 P 15	550 P 15	625 P 15
J	kg/m ²	0,01	0,03	0,06	0,13	0,30	0,48	0,77	1,16	1,93
Weight	kg	4	7,6	13	18	24	28	43	49	59
Maximum speed	rpm	5000	4300	3600	3000	2400	2100	1900	1800	1500
D	mm	175	220	260	315	395	445	495	550	625
D ₁	mm	75	95	120	120	120	120	150	150	150
D ₂	mm	-	-	-	130	200	207	257	312	387
C	mm	55	65	85	102	102	102	135	135	135
C ₁	mm	62,5	72,5	92,5	117	117	117	150	150	150
d máx.	keyed	mm	0-40	0-55	0-75	0-75	0-75	0-100	0-100	0-100
	shrink fit	mm	40	65	80	80	80	100	100	100

Discs and couplings

DISCS - VENTILATED AND SOLID DISCS

Revision number: T02220-01-C

Revision date: 23.08.2022

Thickness 30 mm: Ø315 to 995 mm for solid discs P30

Ø315 to 795 mm for ventilated discs V30

Thickness 42 mm: Ø625 - 795 - 995 mm for ventilated discs V42

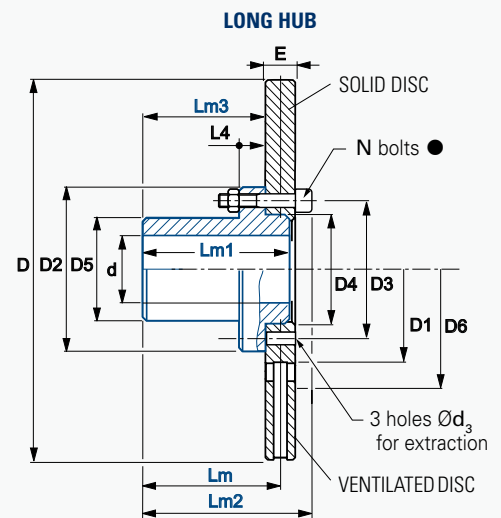
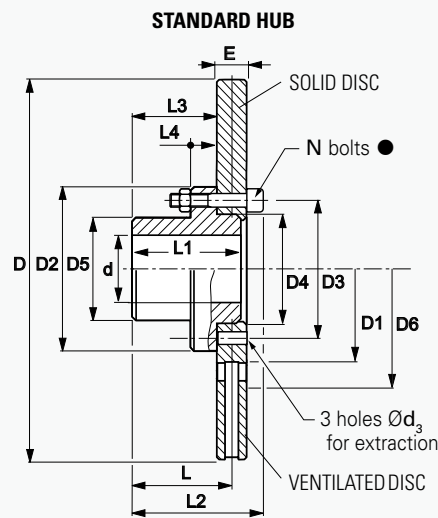
Material of discs and hubs, protection of discs and balancing, see leaflet Nr. T08020-01

Note: hubs are not balanced.

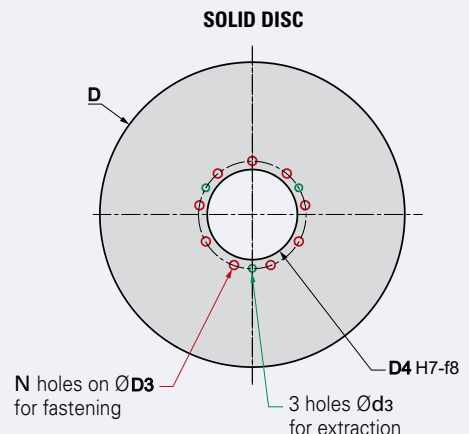
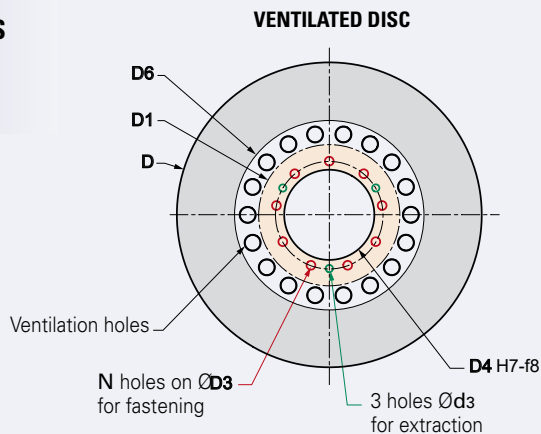
DISCS WITH HUB

●
Screws not tightened to the torque at the delivery

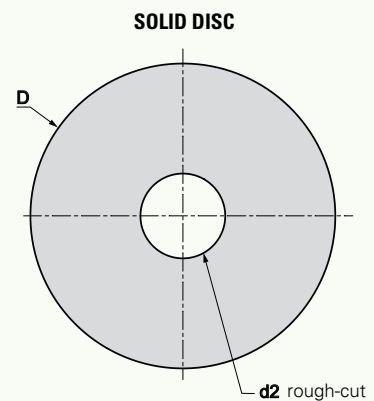
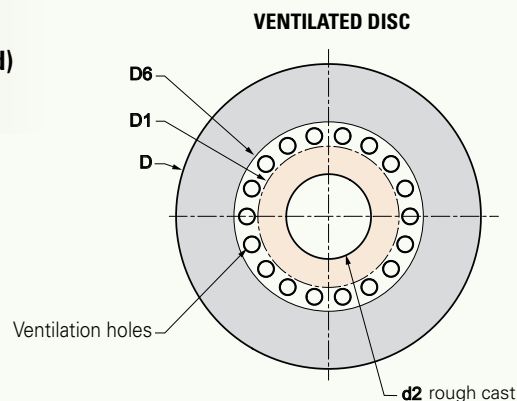
N: Number of bolts
nut H / screw CHc Ød1
class 10-9, with MoS2
lubrication under head and on
thread
Tightening torque β
Clamping tool dispersion = ±10%



DRILLED BARE DISCS (drilled, bored) WITHOUT HUB



BARE DISCS (not drilled, not bored) WITHOUT HUB



DISCS - VENTILATED AND SOLID DISCS

Revision number: T02220-01-C

Revision date: 23.08.2022

Thickness 30 mm: Ø315 to 995 mm for solid discs P30
Ø315 to 795 mm for ventilated discs V30

Thickness 42 mm: Ø625 - 795 - 995 mm for ventilated discs V42

Material of discs and hubs, protection of discs and balancing, see leaflet Nr. T08020-01
Note: hubs are not balanced.

Diameters 315 to 550 mm

Designation		Ø Disc	315		355		395		445		495		550		
		P=solid V=Ventilated 30 = E	P30	V30	P30	V30	P30	V30	P30	V30	P30	V30	P30	V30	
Inertia J	Drilled bare disc	kg.m²	0.225	0.139	0.362	0.226	0.56	0.324	0.896	0.537	1.367	0.843	2.09	1.15	
	Disc/Standard hub		0.234	0.148	0.379	0.243	0.588	0.352	0.94	0.581	1.492	0.968	2.22	1.28	
	Disc/Long hub		0.245	0.159	0.382	0.246	0.593	0.357	0.946	0.587	1.515	0.991	2.243	1.303	
Weight	Drilled bare disc	kg	17	10	21	12	27	16	34	19	41	23	52	29	
	Disc/Standard hub		21.7	14.7	27.5	18.5	34	23	46.5	31.5	65	47	76	53	
	Disc/Long hub		22.5	15.5	30.5	21.5	37.6	26.6	51	36	73	55	84	61	
Maximum speed			rpm	3000		2700		2400		2100		1900		1800	
Max. braking torque ■			N.m	1720		2987		4594		8798		14321		14321	
L	Disc/Standard hub	mm	102		102		102		135		135		135		
L1		mm	107		107		107		140		140		140		
L2		mm	127		129		131		166		168		168		
L3		mm	87		87		87		120		120		120		
L4	Disc/Long hub	mm	28		28		28		30		38		38		
Lm		mm	135		155		155		195		195		195		
Lm1		mm	140		160		160		200		200		200		
Lm2		mm	160		182		182		226		228		228		
Lm3		mm	120		140		140		180		180		180		
D			mm	315		355		395		445		495		550	
D1			mm	-	139	-	172	-	177	-	184	-	230	-	275
D2			mm	125		145		165		175		220		220	
D3			mm	105		125		140		146		190		190	
D4			mm	85		105		115		120		160		160	
D5			mm	80		95		105		110		150		150	
D6			mm	-	165	-	206	-	246	-	216	-	256	-	325
d3			mm	M10		M12		M14		M16		M18		M18	
d2			mm	76.5		96.5		106.5		111.5		151.5		151.5	
d max ** keyed shrink fit			mm	50		60		70		75		100		100	
d1	Assembling bolts	mm	M10		M12		M14		M16		M18		M18		
N			9		9		9		12		12		12		
β		N.m	48		84		133		204		285		285		

■ Maximum braking torque allowed by the bolts of disc and hub assembling.



ATTENTION !

The torque transmissible by shaft and keying must be checked.

** Tolerance on d and keying on Customer demand.

Discs and couplings

DISCS - VENTILATED AND SOLID DISCS

Revision number: T02220-01-C

Revision date: 23.08.2022

Thickness 30 mm: Ø315 to 995 mm for solid discs P30
Ø315 to 795 mm for ventilated discs V30

Thickness 42 mm: Ø625 - 795 - 995 mm for ventilated discs V42

Material of discs and hubs, protection of discs and balancing, see leaflet Nr. T08020-01

Note: hubs are not balanced.

Diameters 625 to 995 mm

Designation		Ø Disc	625		705		625-2		705-2		795		995	625	795	995
			P30	V30	P30	V30	P30	V30	P30	V30	P30	V30	P30	V42		
Inertia J	Drilled bare disc	kg.m²	3.506	2.06	5.69	3.46	3.45	2.004	5.62	3.39	9.23	5.65	22.51	2,5	6,5	20
	Disc/Standard hub		3.676	2.23	5.99	3.76	3.94	2.494	6.11	3.88	9.72	6.14	23.86	2.92	7.85	21.3
	Disc/Long hub		3.699	2.253	6.038	3.808	4.02	2.574	6.13	3.9	9.802	6.222	23.9	-	-	-
Weight	Drilled bare disc	kg	68	41	86	53	63	36	82.5	49.5	110	70	170	45	77	177
	Disc/Standard hub		87.5	60.5	105	72	128.5	101.5	148	115	175.5	135.5	243	90	150	250
	Disc/Long hub		96	69	117	84	144	117	163.5	130.5	191	151	271	-	-	-
Maximum speed		rpm	1500		1300		1500		1300		1200		900	1500	1200	900
Max. braking torque ■		N.m	19915		27905		36 384		73897		73897		73897	36 384	73 897	73 897
L	Disc/Standard hub	mm	135		135		135		135		135		135	141	141	141
L1		mm	140		140		140		140		140		140	140	140	140
L2		mm	170		172		174		174		174		174	186	186	186
L3		mm	120		120		120		120		120		120	120	120	120
L4		mm	38		40		40		40		40		40	40	40	40
Lm	Disc/Long hub	mm	195		195		195		195		195		135	-	-	-
Lm1		mm	200		200		200		200		200		140	-	-	-
Lm2		mm	230		232		234		234		234		174	-	-	-
Lm3		mm	180		180		180		180		180		120	-	-	-
D		mm	625		705		625		705		795		995	625	795	995
D1		mm	343		418		343		418		498		-	302	486	694
D2		mm	235		265		300		300		300		380	300	380	380
D3		mm	205		230		260		260		260		330	260	330	330
D4		mm	170		195		220		220		220		280	220	280	280
D5		mm	150		180		210		210		210		260	210	260	260
D6		mm	-	387	-	462	-	387	-	462	-	542	-	370	542	745
d3		mm	M20		M22		M24		M24		M24		M30	M24	M30	M30
d2		mm	161.5		185.5		161.5		185.5		211.5		211.5	211	211	211
d max **	keyed shrink fit	mm	100		125		140		140		140		180	40-140	40-180	40-180
d1	Assembling bolts	mm	M20		M22		M24		M24		M24		M30	M24	M30	M30
N			12		12		12		12		12		12	12	12	12
β		N.m	398		541		685		685		685		1364	685	1364	1364

■ Maximum braking torque allowed by the bolts of disc and hub assembling.



ATTENTION !

The torque transmissible by shaft and keying must be checked.

** Tolerance on d and keying on Customer demand.

DISCS - VENTILATED AND SOLID DISCS

Revision number: T02220-01-C

Revision date: 23.08.2022

Part numbers of the drilled bare discs (drilled and bored) without hub

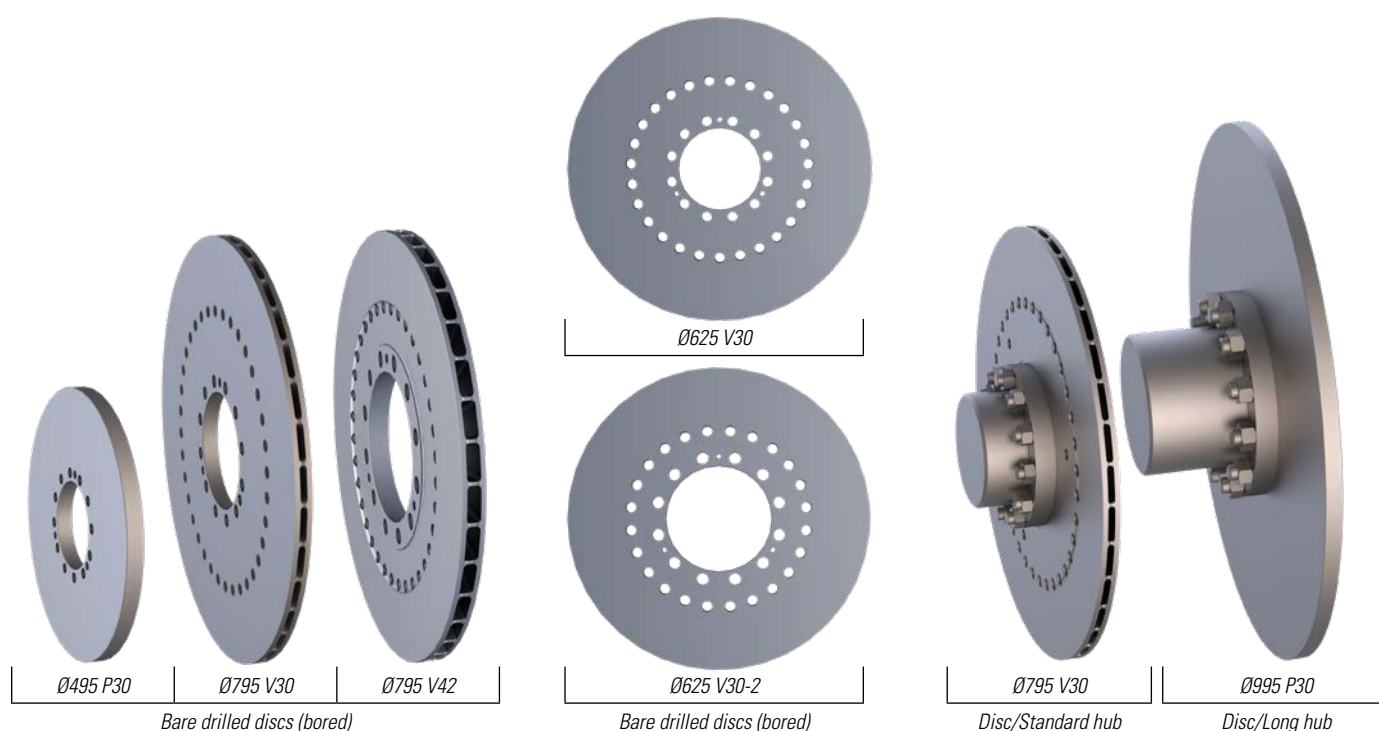
Drilled bare disc (without hub)	Part number
315 P30	944-62830
355 P30	945-44080
395 P30	944-63090
445 P30	944-62820
495 P30	944-62810
550 P30	944-62800
625 P30-1	944-62770
625 P30-2	945-60380
705 P30-1	944-62780
705 P30-2	945-60400
795 P30	944-62790

Drilled bare disc (without hub)	Part number
995 P30	944-63030
315 V30	944-56110
355 V30	944-56450
395 V30	944-56030
445 V30	944-56150
495 V30	944-31330
550 V30	944-56070
625 V30-1	944-56190
625 V30-2	945-60370
705 V30-1	944-56230
705 V30-2	945-60390
795 V30	944-56270

Drilled bare disc (without hub)	Part number
625 V42	944-39640
795 V42	944-38950
995 V42	944-38940

Material of discs and hubs, protection of discs and balancing, see leaflet Nr. T08020-01
Note: hubs are not balanced.

Examples of drilled bare discs and discs with hub



Couplings

DISC COUPLINGS - PND-PNQ-PNF

Revision number: T02805-01-G

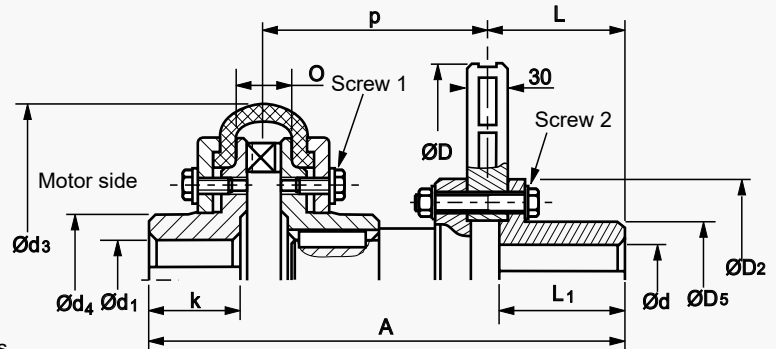
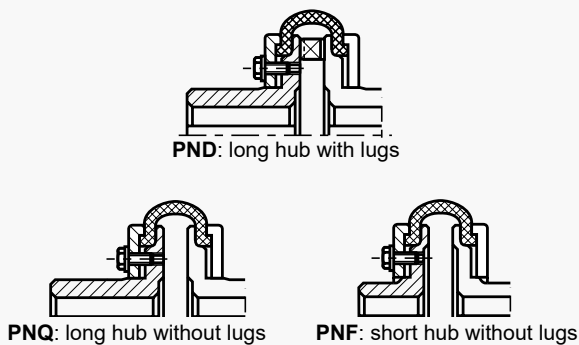
Revision date: 04.09.2023

Flexible coupling **PND**, **PNQ** and **PNF** series
Discs thickness: 30mm
Rubber element and disc can be both removed without moving motor or gearbox back.

Use:
PND: with lugs, compulsory for hoisting, standard model.
PNQ and **PNF:** without lugs, consult us.

Option:
Solid Disc

Screws 1 and 2 not tightened to the torque at the delivery



Disc			315V30		355V30			395V30			445V30					495V30						
Coupling PNF, PNQ and PND			40	63	40	63	125	63	125	200	125-1	125-2	200-1	200-2	200-3	125-1	125-2	200-1	200-2	300-1	300-2	
Assembly	Nominal torque TN	N.m	545	1000	545	1000	2200	1000	2200	3400	2200	2200	3400	3400	3400	2200	2200	3400	3400	5500	5500	
	Max. Torque Tmax	N.m	1200	2400	1200	2400	4800	2400	4800	7500	4800	4800	7500	7500	7500	4800	4800	7500	7500	12000	12000	
	Association pines		650 5K	645 5K	650 650	645 645	645-5K			645 5K	4CA2	645 5K	4CA2	3CA2	645 5K	4CA2	645 5K	4CA2	645 5K	4CA2		
	Maximum speed		tr/mn	3000	2500	2700	2500	2500	2400	2400	2000	2100	2100	2000	2000	2000	1900	1900	1900	1900	1900	1900
	J:																					
	PNF	kgm²	0,18	0,24	0,283	0,333	0,456	0,37	0,589	1,08	0,776	0,656	1,475	1,545		1,266	1,272	1,655	1,68	1,6	1,62	
	PNQ	kgm2	0,182	0,252	0,286	0,344	0,483	0,382	0,616	1,116	0,803	0,683	1,516	1,586		1,293	1,299	1,696	1,721	1,64	1,65	
	PND	kgm2	0,187	0,267	0,291	0,36	0,512	0,397	0,645	1,14	0,832	0,71	1,541	1,61	1,61	1,322	1,328	1,721	1,746	1,66	1,67	
	Poids:																					
	PNF	kg	29,3	35,5	34,8	43	57	45,5	63	93	74	71	94	96		95	98,5	118	128	128,5	131	
PNQ	kg	31,3	38,5	36,8	46	67	48,5	73	103	84	81	104	106		105	108,5	128	138,5	140	142,5		
PND	kg	32,4	40,7	37,9	48,2	68,7	50,7	74,7	107,5	85,7	82,7	108,5	110,5	110,5	106,7	110	132,5	142,5	141,5	144		
A																						
PNF	mm	315	350	315	340	380	340	380	402	413	515	435	568		400	443	435	525	562	582		
PNQ, PND	mm	366	393	366	383	445	383	445	467	478	580	500	633	669	465	508	500	590	622	642		
Disc	D	mm	315		355			395			445			445		495						
	D2	mm	125		145			165			175			175		220						
	D5	mm	80		95			105			110			110		150						
	L	mm	102		102			102			135			135		135						
	L1	mm	107		107			107			140			140		140						
	d max. keyed	mm	50		60			70			70			70		100						
	d max. for shrink fit	mm	50		60			70			70			70		100						
Coupling	d3	mm	210	263	210	263	310	263	310	370	310	310	370	370	370	310	310	370	370	402	402	
	d4	mm	92	120	92	120	154	120	154	155	154	154	155	155	155	154	154	155	155	170	170	
	k PNF	mm	64	74	64	74	89	74	89	95.5	89	89	95.5	95.5		89	89	95.5	95.5	109	109	
	k PNQ, PND	mm	115	117	115	117	154	117	154	160.5	154	154	160.5	160.5	160.5	154	154	160.5	160.5	169	169	
	O	mm	38	44	38	44	42	44	42	48	42	42	46	46	46	42	42	46	46	50	50	
	p	mm	138	161	138	151	178	151	178	192,5	178	280	192,5	325,5	361,5	165	208	192,5	282,5	305	325	
	d1 max. keyed	mm	65	85	65	85	110	85	110	110	110	110	110	110	110	110	110	110	110	120	120	
	d1 max. for shrink fit	mm	60	80	60	80	100	80	100	100	100	100	100	100	100	100	100	100	100	105	105	
	Tightening torque screw 1		N.m	25	49	25	49	49	49	49	49	49	49	49	49	49	49	49	49	86	86	
Tightening torque screw 2		N.m	49	49	86	86	86	135	135	135	210	210	210	210	210	290	290	290	290	290	290	

Maximum permissible torque **Tt**
and working conditions
(ambient temperature ≤ 40°C)

>300 start/h: $T_t = T_N / 2,5$
≤300 start/h AT 120 start/h: $T_t = T_N / 2$
≤120 start/h: $T_t = T_N / 1,5$

NOTE: For shrink fit, k and A are modified (consult us)
At the delivery, screws 1 and 2 are not tightened to the torque
In each case: engine start coupling $T_d < T_{max}$

DISC COUPLINGS - PND-PNQ-PNF

Revision number: T02805-01-G

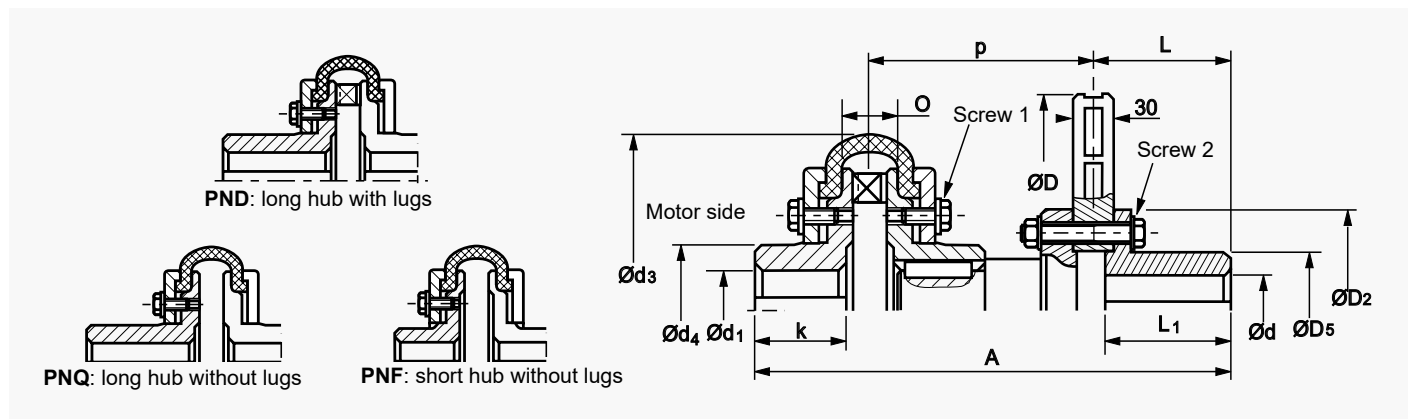
Revision date: 04.09.2023

Flexible coupling **PND**, **PNQ** and **PNF** series
Discs thickness: 30mm
Rubber element and disc can be both removed without moving motor or gearbox back.

Use:
PND: with lugs, compulsory for hoisting, standard model.
PNQ and **PNF:** without lugs, consult us

Option:
Solid Disc

Screws 1 and 2 not tightened to the torque at the delivery



Disc			550V30						625V30			705V30		795V30			
Coupling PNF, PNQ and PND			125	200-1	200-2	300-1	300-2	300-3	200	300	400	400	800	400	800	1500	
Assembly	Nominal torque T_N	N.m	2200	3400	3400	5500	5500	5500	3400	5500	8200	8200	13700	8200	13700	20500	
	Max. Torque T_{max}	N.m	4800	7500	7500	12000	12000	12000	7500	12000	18000	18000	30000	18000	30000	45000	
	Association pines		645 5K	645 5K	4CA2	645 5K	4CA2	3CA2	4CA2	3CA2		3CA2		3CA2			
	Maximum speed		tr/mn	1800	1800	1800	1800	1800	1800	1500	1500	1500	1300	1250	1200	1200	900
	J:																
	PNF	kgm ²	1,68	2,03	2,04	1,95	1,97	1,99	2,49	3,34	4,15	5,43	7,39	7,85	9,82	17,92	
	PNQ	kgm2	1,7	2,07	2,08	1,98	2	2,03	2,53	3,38	4,25	5,52	7,54	7,95	9,96	18,17	
	PND	kgm2	1,73	2,1	2,11	2	2,03	2,06	2,56	3,4	4,33	5,61	7,81	8,05	10,24	18,42	
	Poids:																
	PNF	kg	101	124	126	123	131,5	134,5	137	151	182	191	258	207	283	587	
Disc	PNQ	kg	111	134,5	136,5	134	142,5	145,5	147,5	162,5	202	211	281	227	305,5	623,5	
	PND	kg	112,7	138,5	140,5	136	144,5	148,5	151,5	164	206	215	297,5	231	322,5	641,5	
	A																
	PNF	mm	400	435	450	470	535	580	450	470	575	495	635	495	635	810	
	PNQ, PND	mm	465	500	515	530	595	640	515	530	655	575	715	575	715	905	
	D	mm	550						625			705		795			
	D2	mm	220						235			265		300			
	D5	mm	150						150			180		210			
	L	mm	135						135			135		135			
	L1	mm	140						140			140		140			
	d max. keyed	mm	100						100			120		130			
	d max. for shrink fit	mm	100						100			120		130			
Coupling	d3	mm	310	370	370	402	402	402	370	402	450	450	550	450	550	700	
	d4	mm	154	155	155	170	170	170	155	170	185	185	210	185	210	260	
	k PNF	mm	89	95.5	95.5	109	109	109	95.5	109	119	119	137	119	137	176	
	k PNQ, PND	mm	154	160.5	160.5	169	169	169	160.5	169	199	199	217	199	217	271	
	O	mm	42	46	46	50	50	50	46	50	70	70	120	70	120	150	
	p	mm	165	192.5	207.5	213	278	323	207.5	213	300	220	320	220	320	400	
	d1 max. keyed	mm	110	110	110	120	120	120	110	120	130	130	150	130	150	180	
	d1 max. for shrink fit	mm	100	100	100	105	105	105	100	105	110	110	130	110	130	160	
	Tightening torque screw 1	N.m	49	49	49	86	86	86	49	86	210	210	210	210	210	410	
Tightening torque screw 2	N.m	290	290	290	290	290	290	410	410	410	550	550	710	710	710		

Maximum permissible torque T_t and working conditions (ambient temperature $\leq 40^\circ\text{C}$)	>300 start/h: $T_t = T_N/2,5$	NOTE: For shrink fit, k and A are modified (consult us) At the delivery, screws 1 and 2 are not tightened to the torque In each case: engine start coupling $T_d < T_{max}$
	≤ 300 start/h AT 120 start/h: $T_t = T_N/2$	
	≤ 120 start/h: $T_t = T_N/1,5$	

Couplings

DISC COUPLINGS - PNK

Revision number: T02561-01-B

Revision date: 25.11.2010

Flexible coupling **PNK** series

Solid disc thickness 15 mm

Rubber element and disc can both be removed without disturbing motor or gearbox

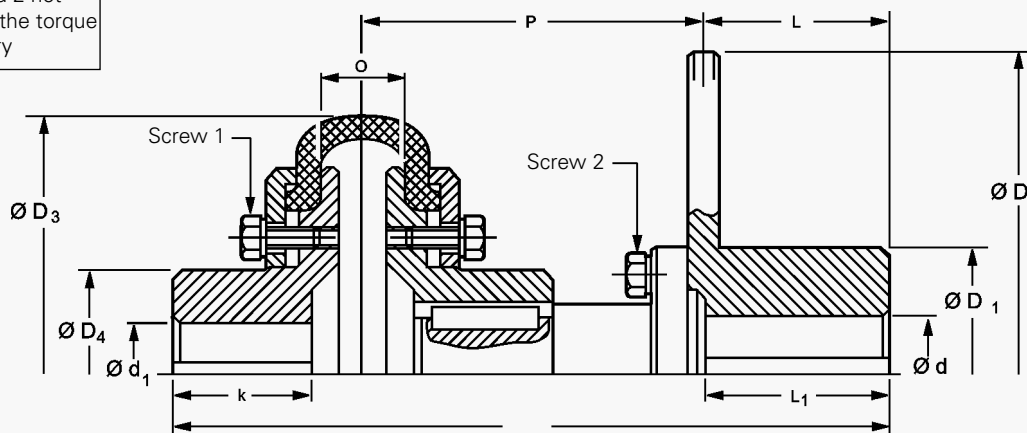
Without lug.

Use:

For horizontal motions

For hoist motions, please consult us.

Screws 1 and 2 not tightened to the torque at the delivery



Designation		DISC Coupling PNK	175P15			220P15			260P15		315P15		395P15		445P15		495P15	550P15	625P15	
			2	6	16	2	6	16	6	16	16	40	40	63	40	63	63	125	125	160
ASSEMBLY	Coupling																			
	Nominal torque Cn	Nm	50	100	200	50	100	200	100	200	200	400	400	800	400	800	800	1600	1600	2000
	Max. torque C _{máx.}	Nm	150	300	600	150	300	600	300	600	600	1200	1200	2400	1200	2400	2400	4800	4800	6000
	Combined caliper		660		650	660		650	660	650	650	645	650	645	650	645	645	645	645	
	Maximum speed	rpm	5000	5000	4000	4300	4300	4000	3600	3600	3000	3000	2400	2400	2100	2100	1900	1800	1500	1500
	J		0,011	0,013	0,023	0,030	0,042	0,045	0,066	0,076	0,146	0,168	0,338	0,408	0,520	0,595	0,89	1,42	2,19	2,58
	Weight	kg	6	7,4	11	9,4	11,6	15,3	18	21,4	26	31,5	38,5	46	42	51	69	89	100	120
	ℓ	mm	185	215	250	195	225	250	245	265	295	340	340	370	340	270	410	460	460	435
DISC	D	mm	175			220			260		315		395		445		495	550	625	
	D ₁	mm	75			95			120		120		120		120		150	150	150	
	L	mm	55			65			85		102		102		102		135	135	135	
	L ₁	mm	58,5			68,5			88,5		112		112		112		145	145	145	
	Bore d keyed	mm	40			55			75		75		75		75		100	100	100	
	max. d shrink fit *	mm	35			50			65		65		65		65		90	90	90	
COUPLING	D ₃	mm	104	136	178	104	136	178	136	178	178	210	210	263	210	263	263	310	310	370
	D ₄	mm	40	55	70	40	55	70	55	70	70	92	92	107	92	107	107	140	140	150
	k	mm	30	45	50	30	45	50	45	50	50	65	65	75	65	75	75	100	100	85
	O	mm	16	18	35	16	18	35	18	35	35	38	38	44	38	44	44	42	42	46
	P	mm	95	105	130	95	105	120	105	115	128	158	158	173	158	173	180	205	205	192.5
	Bore d _i keyed	mm	28	38	48	28	38	48	38	48	48	65	65	75	65	75	75	100	100	100
	max. d _i shrink fit *	mm	28	38	42	28	38	42	38	42	42	60	60	70	60	70	70	90	90	90
Tightening torque in Nm		Screw 1 mm	4	6	15	4	6	15	6	15	15	20	20	25	20	25	25	45	45	55
		Screw 2 mm	25	25	25	25	25	25	25	25	49	69	86	120	86	120	210	210	210	295
Max. transmissible torque (Ct) and working conditions (ambient temperature ≤ 40°C)			> 300 starts/ hour: Ct = Cn / 2.5 ≤ 300 starts/ hour to 120 starts/ hour: Ct = Cn / 2 ≤ 120 starts/ hour: Ct = Cn / 1.5									* For shrink fit, dimensions k and ℓ are altered (consult us) At delivery, screws 1 and 2 are not tightened to the torque. In each case, motor starting torque Cd<Cmax								

DISC COUPLINGS - PNM

Revision number: T02661-01-B

Revision date: 25.11.2010

Coupling **PNM** series

Monobloc disc with thickness: 30mm

Rubber element and disc can both be removed without moving motor or gearbox back

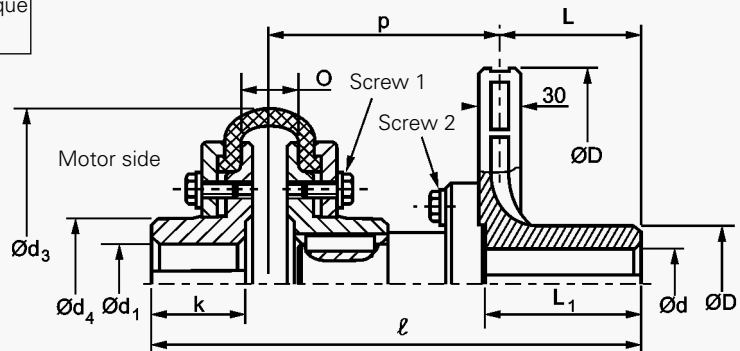
Without lug

Use:

For horizontal motions.

For hoist motions, consult us.

Screws 1 and 2 not tightened to the torque at the delivery



Designation		Disc	220M30			260M30			315M30		
		Coupling PNM	2	6	16	6	16	40	16	40	63
Assembly	Nominal coupling torque Cn	Nm	50	100	200	100	200	400	200	400	800
	Maximum coupling torque Cmax	Nm	150	300	600	300	600	1200	600	1200	2400
	For use with calipers		650 - 5D			650 - 5D			650 - 5D - 5K		
	Maximum speed	tr/mn	4300	4300	4000	3600	3600	3600	3000	3000	3000
	J	kgm ²	0.056	0.06	0.07	0.072	0.085	0.107	0.155	0.178	0.248
Disc	Weight	kg	13	15.2	19	15	18.4	22.5	20	25.5	33.5
	ℓ	mm	244.5	277	309.5	275.5	295.5	332	295	340	358
Coupling	D	mm	220			260			315		
	D ₁	mm	85			85			90		
	L	mm	102			102			102		
	L ₁	mm	112			112			112		
	d min.	mm	20			30			35		
Coupling	d max. keyed	mm	55			55			60		
	d ₃	mm	104	136	178	136	178	210	178	210	263
	d ₄	mm	40	55	70	55	70	92	70	92	107
	k	mm	30	45	50	45	50	65	45	65	75
	O	mm	16	18	35	18	35	38	35	38	44
	p	mm	107.5	120	142.5	118.5	128.5	150	128	158	161
	d ₁ max. keyed	mm	28	38	48	38	48	65	48	65	75
	Tightening torque of screws 1	Nm	4	6	15	6	15	20	20	20	20
	Tightening torque of screws 2	Nm	25	25	25	25	25	69	49	69	69
Maximum permissible torque Ct and working conditions (ambient temperature ≤ 40°C)			>300 start/h: Ct=Cn/2.5 ≤300 start/h at 120 start/h: Ct=Cn/2 ≤120 start/h: Ct=Cn/1.5						In each case, motor starting torque Cd < Cmax Other versions, consult us.		

Couplings

DISC COUPLINGS - MTFD

Revision number: T10220-01-B

Revision date: 09.09.2024

Gear coupling type **MTDF**

Solid discs (**P**) and ventilated discs (**V**)
thickness 30mm

Disc mounting and dismounting without
moving the machines back

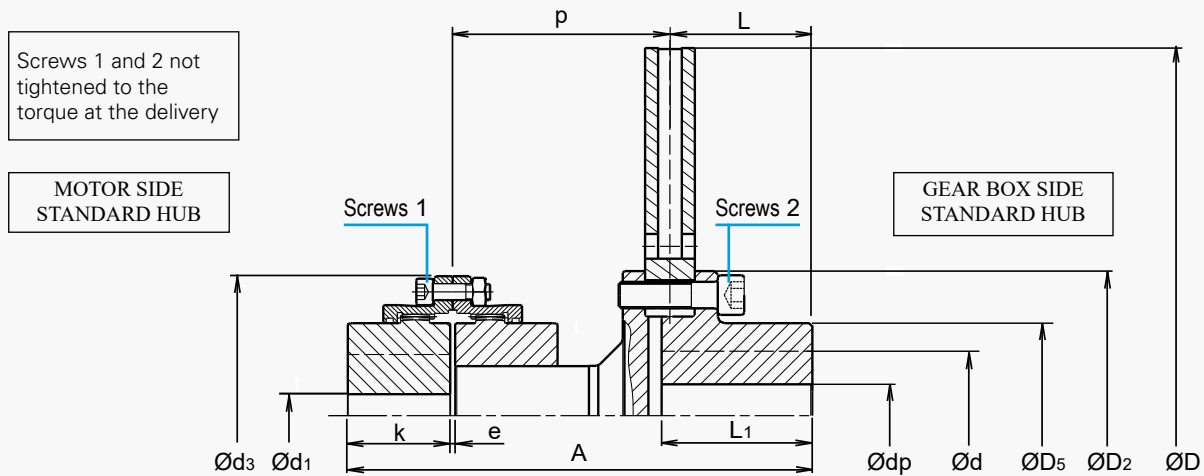
Horizontal operation

(vertical operation: consult us)

Hub and coupling: oiling protection.

Material and balancing of the discs: see
the discs "technical data" leaflet

In standard, only the disc is balanced.
The assembly is balanced on demand
(parts angularly matched).



Degrease faces in contact between disc, hub and coupling

Designation				Disc MTDF	315 P30 / V30		355 P30 / V30		395 P30 / V30			
					62		62		62		78	
Assembly	J	P30	V30	kg.m²	0.246	0.16	0.391	0.255	0.604	0.368	0.622	0.386
	Weight	P30	V30	kg	32	25	39	30	47.5	36.5	53	42
	A			mm	274		274		274		286	
	Maximum speed			rpm	3000		2700		2400			
	Maximum braking torque			N.m	Tb ≤ Tp (Tb = maximum braking torque. Tp = maximum peak torque)							
	For use with calipers				Check that D – D2 > width of the caliper braking surface (ex.: 4CA2 and 3CA2 not associated to discs D < 445) Check that the caliper nominal braking torque is ≤ Tp							
Disc	D			mm	315		355		395			
	D2			mm	125		145		165			
	D5			mm	80		95		105			
	L			mm	102		102		102			
	L1			mm	107		107		107			
	dp			mm	--		--		--			
	d maximum keyed			mm	50		60		70			
	d max. shrink fit			mm	50		60		70			
	Tightening torque screw 2 *			N.m	49		86		135			
Coupling	d3			mm	141		141		141		171	
	e			mm	3		3		3		3	
	k			mm	50		50		50		62	
	p			mm	120.5		120.5		120.5		120.5	
	d1 maximum keyed			mm	62		62		62		78	
	d1 max. shrink fit			mm	-		-		-		-	
	Tightening torque screws 1 *			N.m	20		20		20		42	
	Maximum peak torque (Tp) ♦			N.m	1720		2987		4594		4594	
	Motor Nominal torque (Hoisting)			N.m	1116		1116		1116		2240	
Motor Nominal torque (Translation)			N.m	1395		1395		1395		2800		

*: greased under head and on thread

♦ In every case : T_s < T_p (T_s : motor starting torque)

DISC COUPLINGS - MTDf

Revision number: T10220-01-B

Revision date: 09.09.2024

Gear coupling type **MTDF**

Solid discs (**P**) and ventilated discs (**V**)
thickness 30mm

Disc mounting and dismounting without
moving the machines back

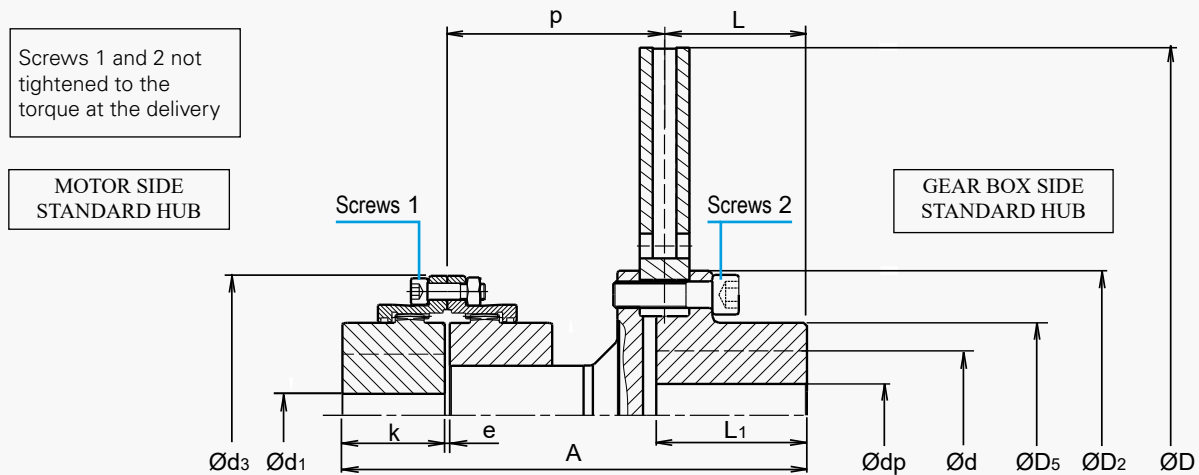
Horizontal operation

(vertical operation: consult us)

Hub and coupling: oiling protection.

Material and balancing of the discs: see
the discs "technical data" leaflet

In standard, only the disc is balanced.
The assembly is balanced on demand
(parts angularly matched).



Degrease faces in contact between disc, hub and coupling

Designation				Disc MTDF	445 P30 / V30						495 P30 / V30					
					62		78		98		78		98		112	
Assembly	J	P30	V30	kg.m²	0.945	0.586	0.964	0.605	1.012	0.653	1.524	1	1.574	1.05	1.664	1.14
	Weight	P30	V30	kg	58	43	64	49	74	59	86	68	97	79	112	94
	A			mm	307		332		361		347		380		410	
	Maximum speed			rpm	2100						1900					
	Maximum braking torque			N.m	Tb ≤ Tp (Tb = maximum braking torque. Tp = maximum peak torque)											
	For use with calipers				Check that D – D2 > width of the caliper braking surface (ex.: 4CA2 and 3CA2 not associated to discs D < 445) Check that the caliper nominal braking torque is ≤ Tp											
Disc	D		mm		445						495					
	D2		mm		175						220					
	D5		mm		110						150					
	L		mm		135						135					
	L1		mm		140						140					
	dp		mm		--						30					
	d maximum keyed		mm		75						100					
	d max. shrink fit		mm		75						100					
	Tightening torque screw 2 *		N.m		210						290					
Coupling	d3		mm		141		171		210		171		210		234	
	e		mm		3		3		5		3		5		5	
	k		mm		50		62		76		62		76		90	
	p		mm		120.5		133.5		147.5		148.5		166.5		182.5	
	d1 maximum keyed		mm		62		78		98		78		98		112	
	d1 max. shrink fit		mm		-		-		-		-		-		-	
	Tightening torque screws 1 *		N.m		20		42		73		42		73		73	
	Maximum peak torque (Tp) ♦			N.m	4594		8798		8798		8798		14321		14321	
	Motor Nominal torque (Hoisting)			N.m	1116		2240		3400		2240		3400		5600	
Motor Nominal torque (Translation)			N.m	1395		2800		4250		2800		4250		7000		

*: greased under head and on thread

♦ In every case : Ts < Tp (Ts : motor starting torque)

Couplings

DISC COUPLINGS - MTDf

Revision number: T10220-01-B

Revision date: 09.09.2024

Gear coupling type **MTDf**

Solid discs (**P**) and ventilated discs (**V**)
thickness 30mm

Disc mounting and dismounting without
moving the machines back

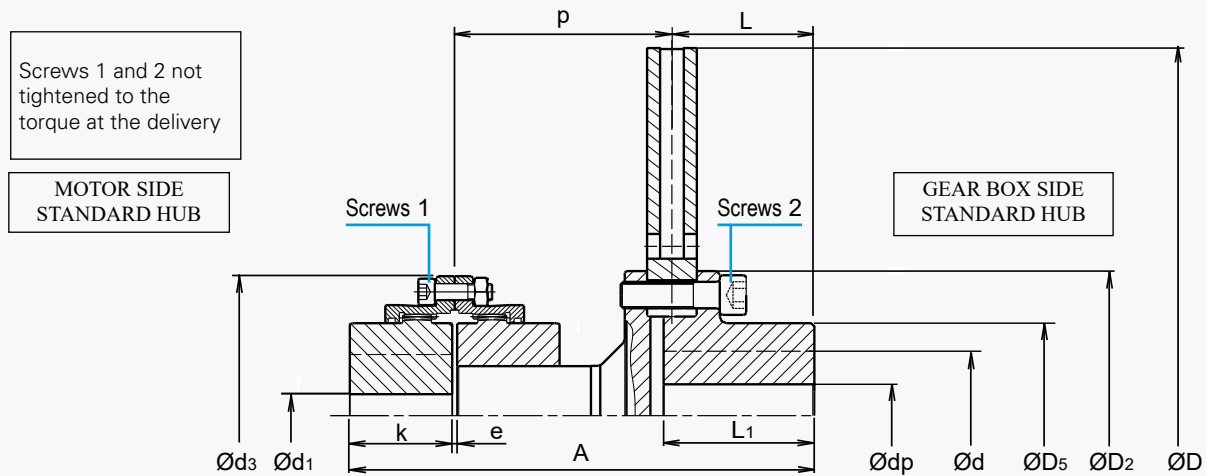
Horizontal operation

(vertical operation: consult us)

Hub and coupling: oiling protection.

Material and balancing of the discs: see
the discs "technical data" leaflet

In standard, only the disc is balanced.
The assembly is balanced on demand.
(parts angularly matched).



Degrease faces in contact between disc, hub and coupling

Designation				Disc MTDF	550 P30 / V30						625 P30 / V30							
					78		98		112		98		112		132		156	
Assembly	J	P30	V30	kg.m ²	2.247	1.307	2.297	1.357	2.387	1.447	3.775	2.329	3.863	2.417	4.065	2.619	4.352	2.906
	Weight	P30	V30	kg	97	74	108	85	123	100	131	104	145	118	167	140	195	168
	A			mm	347		380		410		380		410		441		483	
	Maximum speed			rpm	1800						1500							
	Maximum braking torque			N.m	Tb ≤ Tp (Tb = maximum braking torque. Tp = maximum peak torque)													
	For use with calipers				Check that D – D2 > width of the caliper braking surface (ex.: 4CA2 and 3CA2 not associated to discs D < 445) Check that the caliper nominal braking torque is ≤ Tp													
Disc	D		mm	550						625								
	D2		mm	220						235								
	D5		mm	150						150								
	L		mm	135						135								
	L1		mm	140						140								
	dp		mm	30						30								
	d maximum keyed		mm	100						100								
	d max. shrink fit		mm	100						100								
	Tightening torque screw 2 *		N.m	290						410								
Coupling	d3		mm	171		210		234		210		234		274		312		
	e		mm	3		5		5		5		5		6		6		
	k		mm	62		76		90		76		90		105		120		
	p		mm	148.5		166.5		182.5		166.5		182.5		198		225		
	d1 maximum keyed		mm	78		98		112		98		112		132		156		
	d1 max. shrink fit		mm	-		-		-		-		-		-		-		
	Tightening torque screws 1 *		N.m	42		73		73		73		73		178		178		
	Maximum peak torque (Tp) ♦			N.m	8798		14321		14321		14321		19915		19915		19915	
	Motor Nominal torque (Hoisting)			N.m	2240		3400		5600		3400		5600		9200		14040	
Motor Nominal torque (Translation)			N.m	2800		4250		7000		4250		7000		11500		17550		

*: greased under head and on thread

♦ In every case : Ts < Tp (Ts : motor starting torque)

DISC COUPLINGS - MTDf

Revision number: T10220-01-B

Revision date: 09.09.2024

Gear coupling type **MTDF**

Solid discs (**P**) and ventilated discs (**V**)
thickness 30mm

Disc mounting and dismounting without
moving the machines back

Horizontal operation

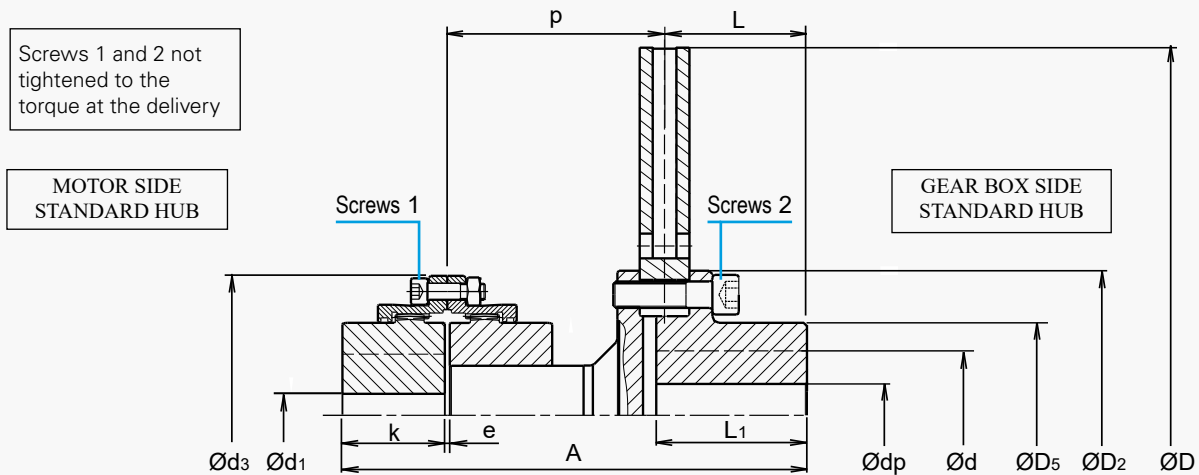
(vertical operation: consult us)

Hub and coupling: oiling protection.

Material and balancing of the discs: see
the discs "technical data" leaflet

In standard, only the disc is balanced.

The assembly is balanced on demand.
(parts angularly matched).



Degrease faces in contact between disc, hub and coupling

Designation				Disc MTDF	705 P30/V30								795 P30/V30					
					112		132		156		174		132		156		174	
Assembly	J	P30	V30	kg.m²	6.165	3.935	6.37	4.14	6.655	4.425	7.153	4.923	10.092	6.512	10.378	6.798	10.872	7.292
	Weight	P30	V30	kg	173	140	196	163	223	190	259	226	233	193	260	220	295	255
	A			mm	410		441		483		513		441		483		513	
	Maximum speed			rpm	1300								1200					
	Maximum braking torque			N.m	Tb ≤ Tp (Tb = maximum braking torque. Tp = maximum peak torque)													
	For use with calipers				Check that D – D2 > width of the caliper braking surface (ex.: 4CA2 and 3CA2 not associated to discs D < 445) Check that the caliper nominal braking torque is ≤ Tp													
Disc	D			mm	705								795					
	D2			mm	265								300					
	D5			mm	180								210					
	L			mm	135								135					
	L1			mm	140								140					
	dp			mm	30								30					
	d maximum keyed			mm	125								140					
	d max. shrink fit			mm	125								140					
	Tightening torque screw 2 *			N.m	550								710					
Coupling	d3			mm	234		274		312		337		274		312		337	
	e			mm	5		6		6		8		6		6		8	
	k			mm	90		105		120		135		105		120		135	
	p			mm	182.5		198		225		239		198		225		239	
	d1 maximum keyed			mm	112		132		156		174		132		156		174	
	d1 max. shrink fit			mm	-		-		-		-		-		-		-	
	Tightening torque screws 1 *			N.m	73		178		178		178		178		178		178	
	Maximum peak torque (Tp) ♦			N.m	19915		27905		27905		27905		27905		36384		36384	
	Motor Nominal torque (Hoisting)			N.m	5600		9200		14040		17760		9200		14040		17760	
Motor Nominal torque (Translation)			N.m	7000		11500		17550		22200		11500		17550		22200		

*: greased under head and on thread

♦ In every case : T_s < T_p (T_s : motor starting torque)

Couplings

DISC COUPLINGS - SERIES E

Revision number: T02580-01-C

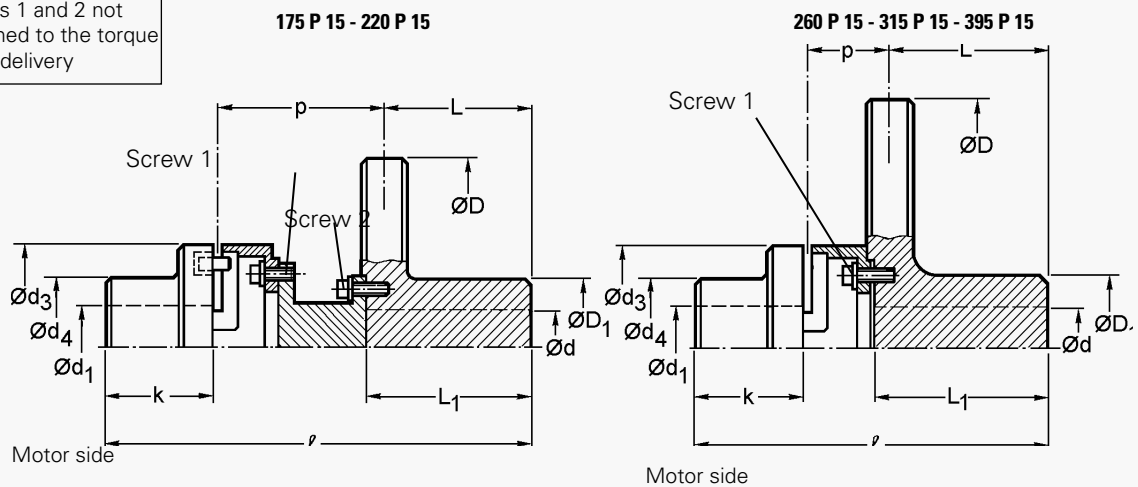
Revision date: 03.10.2024

Flexible coupling "NORMEX" E series

Solid discs Ø 175 to 395

Disc thickness: 15 mm

Screws 1 and 2 not tightened to the torque at the delivery



Degrease faces in contact between disc and coupling.

Designation		Disc	175 P 15		220 P 15		260 P 15		315 P 15			395 P 15		
			97	112	112	128	112	128	112	128	148	128	148	168
Assembly	J	kgm²	0.017	0.019	0.038	0.042	0.065	0.070	0.13	0.135	0.14	0.31	0.315	0.335
	Weight	kg	8	9.5	12.5	15.5	18	21	22	24	28	30	34	39
	For use with caliper	type	660-650		660-650		660-650		660-650			660-650		
	Maximum speed	t/mn	5000		4300		3600		3000			2400		
	ℓ	mm	183	244	211	244	190	201	214.5	225.5	230	225.5	230	245
Disc	D	mm	175		220		260		315			395		
	D1	mm	75		95		120		120			120		
	L	mm	55		65		85		102			102		
	L1	mm	58.5		68.5		88.5		113			112		
	d max. keyed	mm	44		55		55		60			60	65	
	d max. for shrink fit	mm	40		55		55		60			60	65	
Coupling Pb/75	d3	mm	97	112	112	128	112	128	112	128	148	128	148	168
	d4	mm	69	79	79	90	79	90	79	90	107	90	107	124
	k	mm	50	60	60	70	60	70	60	70	80	70	80	90
	p	mm	76.5	127.25	84.25	107.25	43.25	44.25	50.75	51.75	46.25	51.75	46.25	51.25
	d1 max. keyed	mm	42	48	48	55	48	55	48	55	65	55	65	75
	Peak max. torque(Cp)	Nm	200	310	310	500	310	500	310	500	800	500	800	1300
	Max. permissible torque (Ct) and working conditions (Ambient temperature ≤ 40 °C)		150 starts/ hour 8 h/24 h - Ct ≤ Cp/2.5 300 starts/ hour 8 h/24 h - Ct ≤ Cp/3.2 600 starts/ hour 8 h/24 h - Ct ≤ Cp/4											
			In every case: Cd < Cp (Cd motor starting torque) (Ct: motor nominal torque)											
	Tightening torque on screws (1) and (2) *	Nm	10	25	25	25	25	25	25	25	49	25	49	86

DISC COUPLINGS - SERIES E

Revision number: T02580-01-C

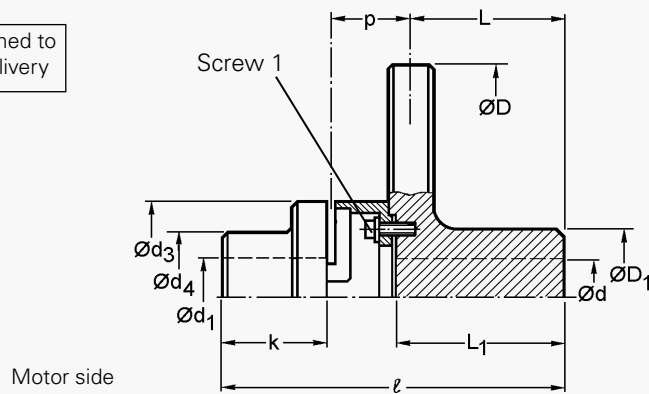
Revision date: 03.10.2024

Flexible coupling "NORMEX" E series

Solid discs Ø 445 to 625

Disc thickness: 15 mm

Screws 1 not tightened to the torque at the delivery



Degrease faces in contact between disc and coupling.

Designation		Disc	445 P 15				495 P 15			550 P 15				625 P 15		
			128	148	168	194	148	168	194	148	168	194	214	168	194	214
Assembly	J	kgm ²	0.49	0.495	0.515	0.55	0.785	0.815	0.84	1.175	1.205	1.23	1.30	1.975	2	2.07
	Weight	kg	33	37	43	51	52	58	66	58	64	72	80	74	82	90
	For use with caliper	type	660-650-645				660-650-645			660-650-645				660-650-645		
	ℓ	mm	225.5	230	245	260	263	278	293	263	278	293	308	278	293	308
Disc	D	mm	445				495			550				625		
	D1	mm	120				150			150				150		
	L	mm	102				135			135				135		
	L1	mm	112				145			145				145		
	d max. keyed	mm	60	65			65	70		65	70	70	90	70	70	90
Coupling Pb75	d max. for shrink fit	mm	60	65			65	70		65	70	70	90	70	70	90
	d3	mm	128	148	168	194	148	168	194	148	168	194	214	168	194	214
	d4	mm	90	107	124	140	107	124	140	107	124	140	157	124	140	157
	k	mm	70	80	90	100	80	90	100	80	90	100	110	90	100	110
	p	mm	51.75	46.25	51.25	56.25	46.25	51.25	56.25	46.25	51.25	56.25	61	51.25	56.25	61
	d1 max. keyed	mm	55	65	75	85	65	75	85	65	75	85	95	75	85	95
	Peak max. torque (Cp)	Nm	500	800	1300	2000	800	1300	2000	800	1300	2000	3100	1300	2000	3100
	Max. permissible torque (Ct) and working conditions (Ambient temperature ≤ 40 °C)		150 starts / hour 8 h/24 h - Ct ≤ Cp/2.5 300 starts / hour 8 h/24 h - Ct ≤ Cp/3.2 600 starts / hour 8 h/24 h - Ct ≤ Cp/4												In every case: Cd < Cp (Cd motor starting torque) (Ct: motor nominal torque)	
	Tightening torque on screw (1) *	Nm	25	49	86	86	49	86	86	49	86	86	135	86	86	135

Couplings

DISC COUPLINGS - SERIES E

Revision number: T02680-01-C

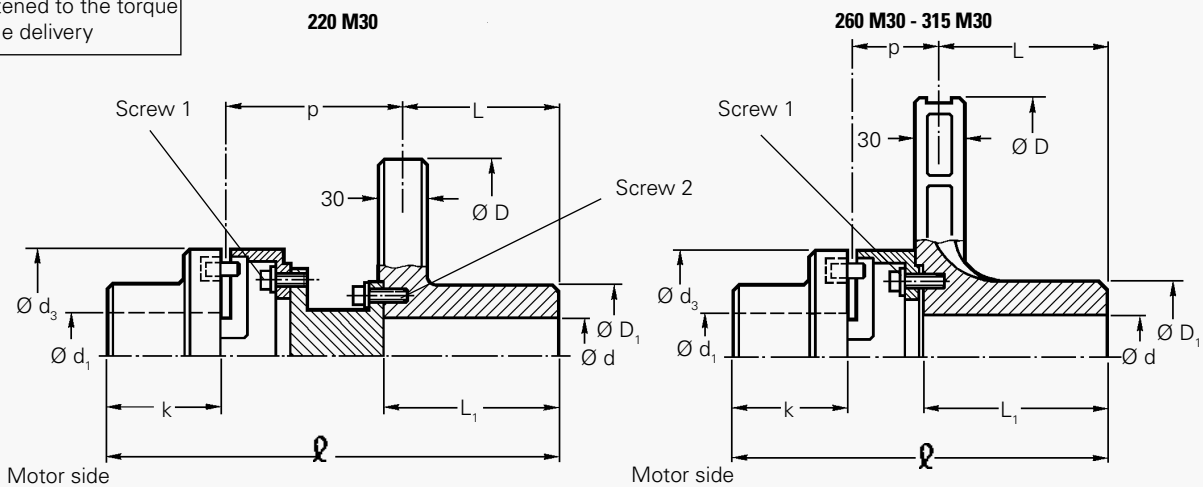
Revision date: 03.10.2024

Flexible coupling E series

Monobloc discs Ø 220 - 260 - 315

Disc thickness: 30 mm

Screws 1 and 2 not tightened to the torque at the delivery



Degrease faces in contact between disc and coupling.

Designation			Disc		220 M 30		260 M 30		315 M 30		
Flexible coupling			112	128	112	128	112	128	148		
Assembly	J	kgm²	0,063	0,067	0,078	0,09	0,145	0,155	0,16		
	Weight	kg	16,2	19,2	15	18	17	20	24,5		
	For use with calipers	Type	650-5D		650-5D		650-5D-5K		650-5D		
	Maximum speed	r.p.m	4 300		3 600		3 000				
	ℓ	mm	313,5	323,5	220,5	231,5	231,5	225,5	230		
Disque	D	mm	220		260		315				
	D1	mm	85		85		90				
	L	mm	102		102		102				
	L1	mm	113		120		113				
	d (pilot bore)	mm	20		30		35				
	d max. keyed	mm	55		55		60				
	d max. shrink fitted	mm	55		55		60				
Coupling Pb75	k	mm	60	70	60	70	60	70	80		
	p	mm	149,75	149,75	56,75	57,75	50,75	51,75	46,25		
	d3	mm	112	128	112	128	112	128	148		
	d1 max. keyed	mm	48	55	48	55	48	55	65		
	d1 max. shrink fitted	mm	-	-	-	-	-	-	-		
	Peak maxi. torque (Cp)	Nm	310	500	310	500	310	500	800		
	Transmissible torque (Ct) and working conditions (ambient temperature ≤ 40°C)		150 starts/hour 8 h/24 h - Ct ≤ Cp/2,5 300 starts/hour 8 h/24 h - Ct ≤ Cp/3,2 600 starts/hour 8 h/24 h - Ct ≤ Cp/4					In every case: Cd < Cp (Cd: motor starting torque) (Ct: motor nominal torque)			
	Tightening torque of screws 1 & 2 *		Nm	20	20	20	20	20	44		

*: stopped with normal glue

Couplings

DISC COUPLINGS - SVKL AND SDKL

Revision number: T10152-01-M

Revision date: 08.07.2022

Elastic couplings series **SVKL** and **SDKL**

Long hub on motor side

Ventilated Discs thickness: **30 mm**

Disc mounting and dismounting without moving the machines back

• **SVKL**: Rubber element **V**

• **SVDL**: Rubber element **D**

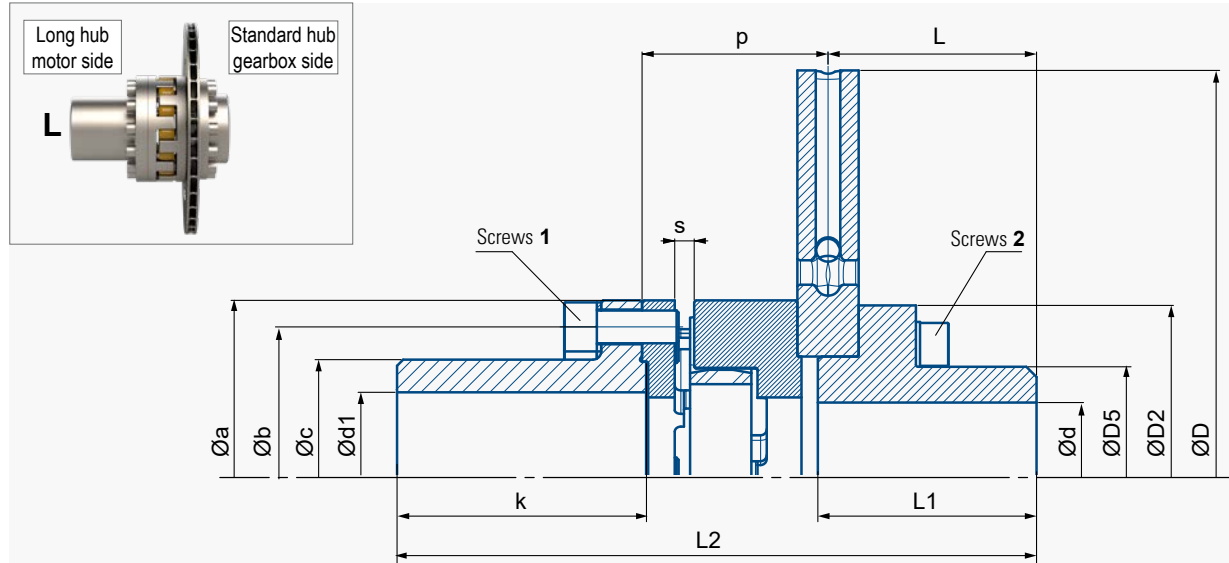
• Working temperature: -25°C to +80°C

Option:

• Solid Disc

• Painted coupling

Note: In standard, couplings are delivered oiled without protection



Degrease faces in contact between disc and coupling.

Elastic couplings SVKL / SDKL			125	145		170		200	230		
Disc diameter (th.30)			315	315	355	395	445	445	495	550	
For use with calipers type			650 . 5K	650 . 645 . 45K		650 . 645 . 5K . 45K		650 . 645 . 5K . 45K	650 . 645 . 5K . 45K		
					5K		4CA2 . 3CA2		4CA2	4CA2 . 3CA2	
ASSEMBLY	J with ventilated disc	kg.m²	0.17	0.18	0.27	0.42	0.68	0.73	1.2	1.74	
	J with solid disc	kg.m²	0.26	0.27	0.41	0.66	1.04	1.09	1.69	2.68	
	Max. weight bored	kg	27	31	37	48	57	64	96	107	
	Maximum speed	r.p.m.	3000	3000	2700	2400	2100	2100	1800	1800	
DISC	L2		286.5	298	298	331.5	364.5	364.5	412.5	412.5	
	ØD	mm	315	315	355	395	445	445	495	550	
	ØD2	mm	125	125	145	165	175	175	220	220	
	ØD5	mm	80	80	95	105	110	110	150	150	
COUPLING	Ød max keyed or shrink fit		mm	50	50	60	70	70	70	100	100
	L	mm	102	102	102	102	135	135	135	135	
	L1	mm	107	107	107	107	140	140	140	140	
	Øa	mm	125	145	145	170	170	200	230	230	
	Øb	mm	105	125	125	144	144	165	190	190	
	Øc	mm	80	100	100	112	112	130	150	150	
	Ød1 max keyed		mm	55	70	70	80	80	95	110	110
	k	mm	110.5	110.5		140.5		130.5	169.5		
	p	mm	76	87.5		91		101	110		
	s	mm	6	6.5		7.5		8.5	9.5		
	Max. torque	Rubber element	V	750	1200	1200	1900	1900	2880	5150	5150
	Tkmax in Nm		D	1110	1800	1800	2850	2850	4950	7740	7740
Transmissible torque (Tk _n) (Tk _n : motor nominal torque)			Tk _n ≤ Tk _{max} /k Ts < Tk _{max}		k min.	Temperature Rate	k=3 ≤ 40°C ≤ 120 starts/h	k=4 ≤ 80°C ≤ 240 starts/h	k=6 ≤ 80°C ≤ 600 starts/h		
* Tightening torque	Screws 1	Nm	48	84	84	204	204	204	285	285	
	Screws 2	Nm	48	48	84	133	204	204	285	285	

* Screws class 10.9 greased with molybdenum bisulphide grease under the head and in threads.

Ts: motor starting torque. In all cases, Ts < Tkmax

Tightening tool dispersion = ±10%

DISC COUPLINGS - SVKL AND SDKL

Revision number: T10152-01-M

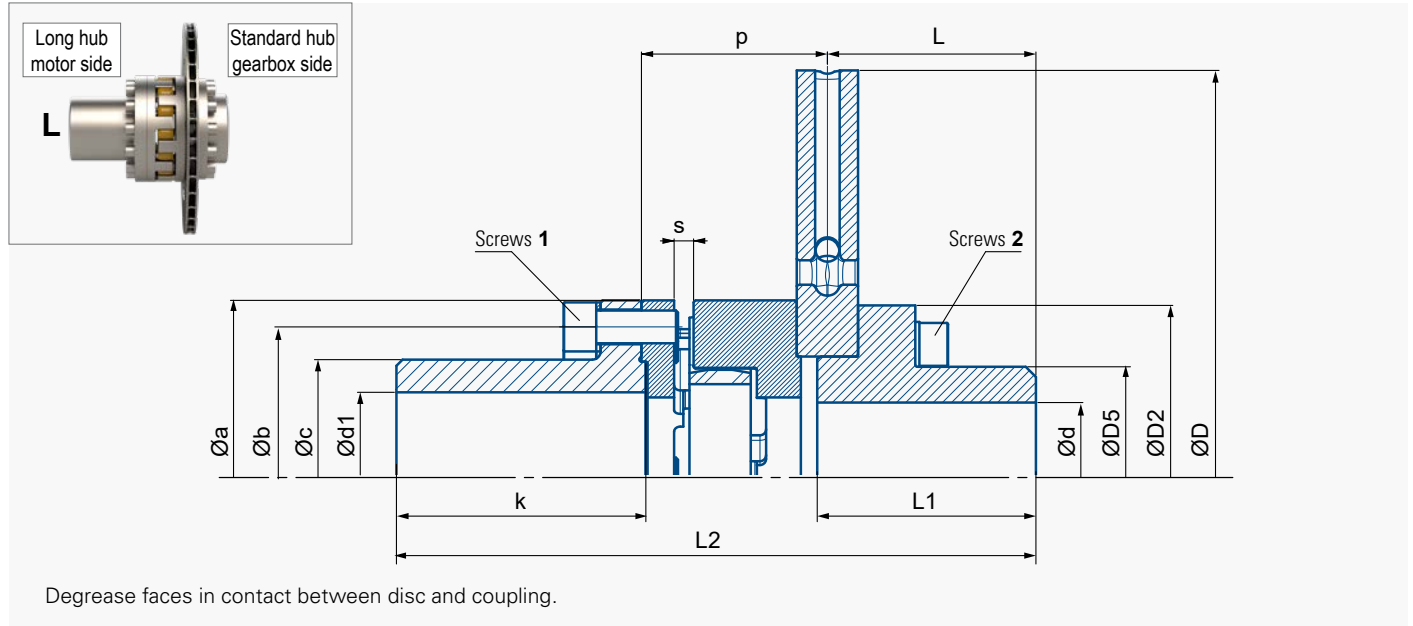
Revision date: 08.07.2022

Elastic couplings series **SVKL** and **SDKL**
Long hub on motor side
Ventilated Discs thickness: **30 mm**
Disc mounting and dismantling without moving the machines back

- SVKL: Rubber element **V**
- SVDL: Rubber element **D**
- Working temperature: -25°C to +80°C

Option:

- Solid Disc
 - Painted coupling
- NOTE: In standard, couplings are delivered oiled without protectio



Elastic couplings SVKL / SDKL			260			300				400		
Disc diameter (th.30)			550	625	705	625-2	705	705-2	795	705	795	
For use with calipers type			650 . 645 . 5K . 45K 4CA2 . 3CA2		4CA2 . 3CA2	650 . 645 . 45K 5K . 4CA2 . 3CA2	4CA2 . 3CA2			4CA2 . 3CA2		
ASSEMBLY	J with ventilated disc	kg.m²	1.97	2.77	4.66	4.52	5.09	5.23	7.86	7.44	10.21	
	J with solid disc	kg.m²	2.91	4.22	6.89	5.23	7.32	7.81	11.44	9.67	13.79	
	Max. weight bored	kg	120	140	170	185	215	229.5	250	300	356	
	Maximum speed	r.p.m.	1800	1500	1300	1500	1300	1300	1200	1300	1200	
	L2		469	469	469	480	480	480	480	537	537	
DISC	ØD	mm	550	625	705	625	705	705	795	705	795	
	ØD2	mm	220	235	265	300	265	300	300	265	300	
	ØD5	mm	150	150	180	210	180	210	210	180	210	
	Ød max keyed or shrink fit	mm	100	100	120	130	120	130	130	120	130	
COUPLING	L	mm	135	135	135	135	135	135	135	135	135	
	L1	mm	140	140	140	140	140	140	140	140	140	
	Øa	mm	260	260	260	300	300	300	300	400	400	
	Øb	mm	220	220	220	260	260	260	260	335	335	
	Øc	mm	175	175	175	210	210	210	210	250	250	
	Ød1 max keyed	mm	125	125	125	140	140	140	140	160	160	
	k	mm	209.5			209.5			250			
	p	mm	126.5			137.5			154			
	s	mm	9.5			10.5			10.5			
	Max. torque	Rubber element	V	7950	7950	7950	11700	11700	11700	11700	26700	26700
	Tkmax in Nm		D	11940	11940	11940	17550	17550	17550	17550	30360	39700
	Transmissible torque (Tk _n) (Tk _n : motor nominal torque)			Tk _n ≤ Tk _{max} /k Ts< Tk _{max}		k min.	Temperature Rate	k=3 ≤ 40°C ≤ 120 starts/h	k=4 ≤ 80°C ≤ 240 starts/h	k=6 ≤ 80°C ≤ 600 starts/h		
* Tightening torque	Screws 1	Nm	541	541	541	685	685	685	685	1364	1364	
	Screws 2	Nm	285	398	541	541	541	685	685	541	685	

* Screws class 10.9 greased with molybdenum bisulphide grease under the head and in threads. Ts: motor starting torque. In all cases, Ts < Tk_{max}
Tightening tool dispersion = ±10%

Couplings

COUPLINGS - SVR & SDR

Revision number: T10174-01-C

Revision date: 12.02.2024

Elastic couplings series **SVR** and **SDR**

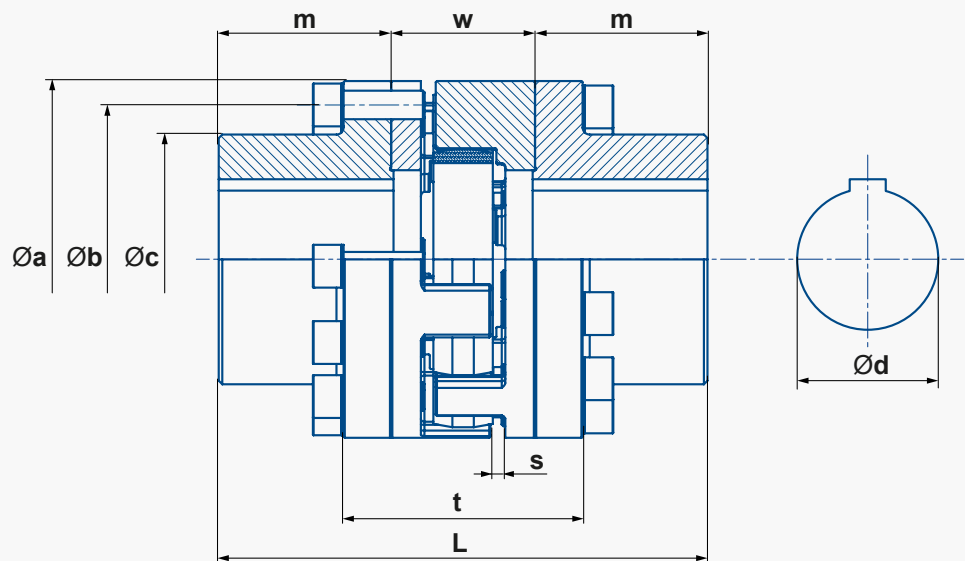
Replacement of the rubber element without moving back the machines

- **SVR**: Rubber element **V**
- **SDR**: Rubber element **D**

- Working temperature: -25°C to +80°C

Options:

Long hub (motor or/and gearbox side)
Consult us



Elastic couplings SVR / SDR		125	145	170	200	230	260	300	400
Inertia J kg.m²		0,02	0,037	0,077	0,16	0,312	0,63	1,296	4,288
Max. weight bored kg		11	16	25	38,5	56	86	134	255
Maximum speed r.p.m.		3000	3000	2400	2100	1800	1800	1500	1300
L		194	218	247	292	304	364	411	487
t mm		102	108	117	132	151	182	121	227
Øa mm		125	145	170	200	230	260	300	400
Øb mm		105	125	144	165	190	220	260	335
Øc mm		80	100	112	126	140	168	190	240
Ød max keyed mm		55	70	80	90	100	120	125	150
m mm		66	75	85	100	105	125	145	175
w mm		62	68	77	92	94	114	121	137
s mm		6	6,5	7,5	8,5	9,5	9,5	10,5	10,5
Max. torque Tkmax in Nm	Rubber element V	750	1200	1900	2880	5150	7950	11700	26700
	D	1110	1800	2850	4950	7740	11940	17550	39700
Transmissible torque (Tkn) (Tkn: motor nominal torque)		Tkn ≤ Tkmax/k Ts< Tkmax		k min. Temperature Rate	k=3 < 40°C ≤ 120 starts/h	k=4 < 80°C ≤ 240 starts/h	k=6 ≤ 80°C ≤ 600 starts/h		
Tightening torque of the screws * Nm		48	84	204	204	285	541	685	1364

* Screws class 10.9 greased with molybdenum bisulphide grease under the head and in threads. **Ts**: motor starting torque. In all cases, **Ts < Tkmax**
Tightening tool dispersion = ±10%

COUPLINGS - SVW & SDW

Revision number: T10156-01-C

Revision date: 27.08.2020

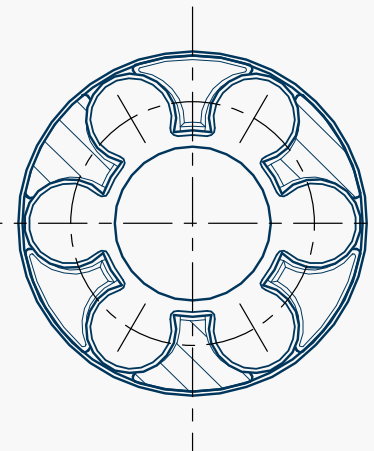
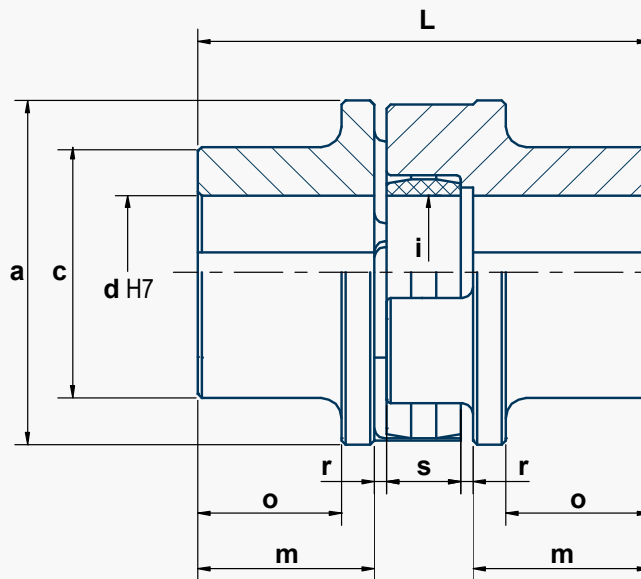
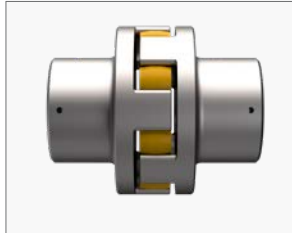
- Cam ring **V**
- Cam ring **D**
(Specify type of cam ring with order)
- Working temperature: -25°C to +80°C

Option:

- Long hub (motor or/and gearbox side)
- Short hub (motor or/and gearbox side)
Consult us.

- Painted coupling

Note: In standard, couplings are delivered oiled without protection



Coupling size SVW- / SDW-			50	70	85	100	125	145	170	200	230	260	300	400
Cam ring n°			50V	70V	85V	100V	125V	145V	170V	200V	230V	260V	300V	400V
SVW					85D	100D	125D	145D	170D	200D	230D	260D	300D	400D
SDW														
Qty of cams			4	6	6	6	6	6	8	8	10	10	10	14
Mass moment of inertia			kgm ²	0.0002	0.001	0.002	0.005	0.010	0.021	0.047	0.108	0.195	0.385	0.735
Weight			kg	0.68	1.64	2.5	4.5	7	9.5	16	27.5	40	57	84
Max. r.p.m.			tr/mn	9000	7500	7000	5600	5000	5000	4000	3600	3200	2500	2000
Diameters	a	mm	50	70	85	105	126	145	170	200	230	260	300	400
	c	mm	42	55	62	72	88	90	112	125	140	150	200	225
	d pilot bored.	mm	-	-	-	15	20	20	25	25	35	35	40	40
	d max.	mm	24	32	42	48	60	65	75	90	100	105	140	160
	i	mm	19	29	38	46	56	63	90	102	117	140	162	250
Lengths	L	mm	75	100	110	125	145	160	190	245	270	285	330	400
	m	mm	29.5	38.5	43	49	56	60.5	74.5	98.5	110	112.5	131.5	163.5
	o	mm	23.5	31.5	35	37.5	44	46.5	56.5	77.5	87	87.5	106.5	127.5
	s	mm	12	18	18	20	25	30	30	35	35	45	50	55
	r	mm	2	2.5	3	3.5	4	4.5	5.5	6.5	7.5	7.5	8.5	9
Max. torque			Nm	40	140	225	390	750	1200	1900	2880	5150	7950	11700
Tkmax			Nm			350	610	1110	1800	2850	4950	7740	11940	17550
SDW														
Transmissible torque (Tkn) (Tkn: motor nominal torque)			Tkn ≤ Tkmax/k k min. Temperature k=3 < 40°C k=4 < 80°C k=6 ≤ 80°C Ts < Tkmax Rate ≤ 120 starts/h ≤ 240 starts/h ≤ 600 starts/h											

Ts: motor starting torque. In all cases, Ts < Tkmax

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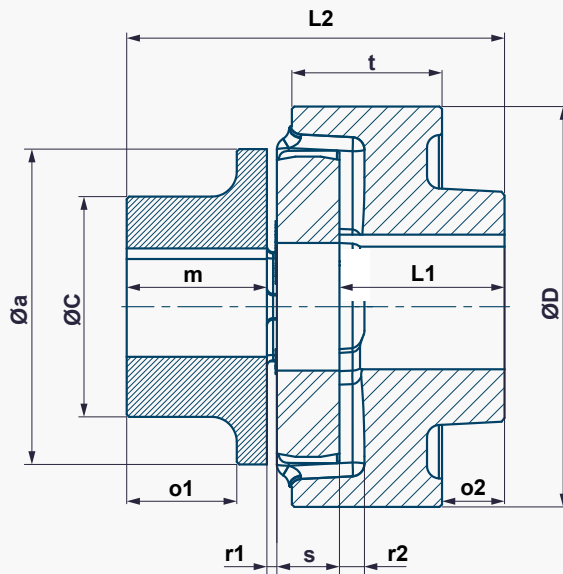
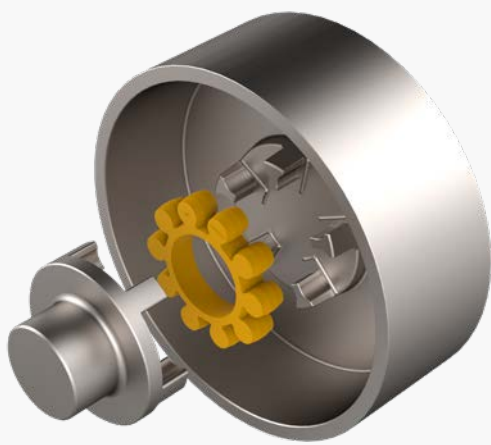
DRUM COUPLINGS - SVT

Revision number: T10178-01-A

Revision date: 01.09.2020

- SVT: Rubber element **V**
- SDT: Rubber element **D**
- Working temperature: -25°C to +80°C

Without specification on the order, couplings are delivered without boring.



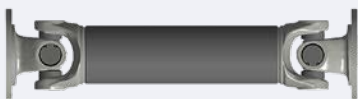
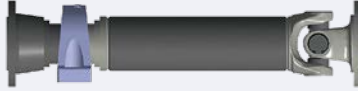
Elastic couplings SVT / SDT			125	145	170	200	230	260
Drum diameter			160	200	250	315	400	630
ASSEMBLY	J	kg.m ²	0,03	0,075	0,2	0,5	1,5	12
	Max. weight bored	kg	11	17	30	53,5	85	210
	Maximum speed	r.p.m.	3000	3000	2400	2100	1800	1500
	L2		151	156	178,5	251	271	286
DRUM	ØD	mm	160	200	250	315	400	630
	t	mm	60	75	95	118	150	236
	L1	mm	56	61	63,5	111	118,5	121
	Ød max keyed or shrink fit	mm	50	50	70	70	100	100
COUPLING	Øa	mm	125	145	170	200	230	260
	Øc	mm	88	90	112	120	140	140
	Ød1 max keyed	mm	55	70	80	90	100	100
	m	mm	56	60,5	74,5	98,5	110	112,5
	o1	mm	44	46,5	56,5	77,5	87	87,5
	o2	mm	25	21	14,5	38	36	20
	r1	mm	4	4,5	5,5	6,5	7,5	7,5
	r2	mm	10	5	5	5	5	5
	s	mm	25	30	30	35	35	45
	Max. torque	Rubber element V	750	1200	1900	2880	5150	7950
	Tk_{max} in Nm	Rubber element D	1110	1800	2850	4950	7740	11940
Transmissible torque (Tk_n) (Tk_n : motor nominal torque)			Tk_n ≤ Tk_{max}/k k min. T° k=3 < 40°C k=4 < 80°C k=6 ≤ 80°C Ts < Tk_{max} Rate ≤ 120 starts/h ≤ 240 starts/h ≤ 600 starts/h					

Ts: motor starting torque. In all cases, **Ts < Tk_{max}**

CARDAN SHAFTS



MAIN CHARACTERISTICS	ADVANTAGES
- TRANSMISSION OF AN ANGULAR ROTATION - COUPLING OF 2 ROTATING NON-ALIGNED SHAFTS	- MAINTENANCE FREE - do not need lubrication - FEWER FAILURES - closed system without loss of grease and without penetration of water and dirt - LONG SERVICE LIFE - SAE or involute splines: optimization in accordance with size and utilization of the cardan shaft

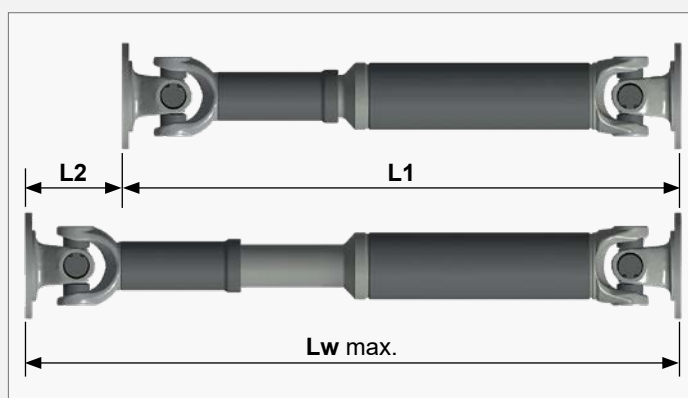
Type	Design	Description
ACS-100		With length compensation
ACS-105		With length compensation in double-flange design
ACS-110		Short couple shaft
ACS-130		Tube shaft without length compensation
ACS-135		Tube shaft without length compensation in double-flange design
ACS-160		Intermediate shaft
ACS-220		Intermediate tube shaft

L1 = compressed length

L2 = maximum possible length compensation

Lw max. = maximum possible working length

Optimal working length = **Lw opt.** = **L1 + ½ L2**



Cardan Shafts

ACCESSORIES - CARDAN SHAFTS TYPE ACS

Revision number: T10155-01-D

Revision date: 01.02.2023

Cardan Shaft Sizes

Size	Swing diameter mm	Bearing torque Nm	Feature
1	up to 76	up to 600	One-piece bearing yokes Length compensation with involute spline Flange yoke with DIN or SAE connection
2	100 - 144	1.400 - 6.000	One-piece bearing yokes Length compensation with involute spline Flange yoke with DIN, SAE or cross-serrated connection Maintenance-free U-joints
3	158 - 204	8.800 - 20.000	One-piece bearing yokes Length compensation with involute spline or straight flank spline (SAE) Application-related spline coating Flange yoke with DIN, SAE or cross-serrated connection, as well as with face key Maintenance-free U-joints
4	220 - 315	26.000 – 143.000	One-piece bearing yokes Length compensation with involute spline or straight flank spline (SAE) Application-related spline coating Flange yoke with DIN, face key or Hirth-serration Maintenance-free U-joints
5	350 - 620	210.000 – 1.250.000	One-piece bearing yokes Length compensation with involute spline or straight flank spline (SAE) Application-related spline coating Flange yoke with DIN, face key or Hirth-serration Double flange design
6	from 680	from 1.950.000	One-piece bearing yokes Length compensation with straight flank spline (SAE) Application-related spline coating Flange yoke with face key or Hirth-serration Double flange design

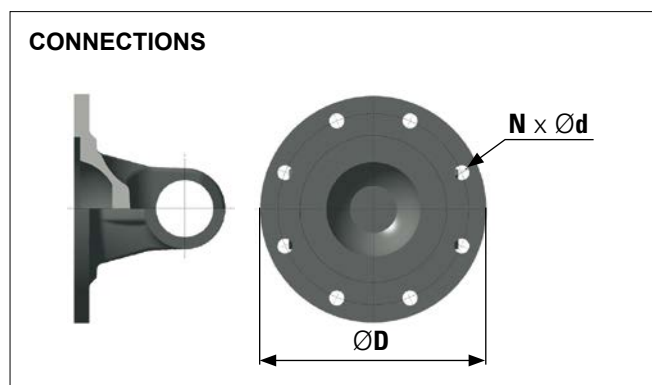
ACCESSORIES - CARDAN SHAFTS TYPE ACS

Revision number: T10155-01-D

Revision date: 01.02.2023

Series 1, 2 and 3

Series		1	2			3			
Size		07600	10000	11600	12600	15800	17200	17800	20400
DESIGN	Bearing Torque Nm	600	1.400	3.000	5.300	8.800	12.500	17.000	20.000
	Reversing Fatigue Torque Nm	300	700	1.500	2.300	4.400	5.100	8.500	11.000
	Joint Performance Factor Nm	220	660	990	1.780	2.400	3.500	4.600	6.800
	Swing Diameter mm	76	100	116	126	158	172	178	204
		L1 min	251	421	451	536	560	566	661
		L2 min	80	110	110	110	110	110	140
		tube size	50	50 / 76,2	70 / 90	90	120	120	140
		L1 min	225	240	290	340	400	430	450
		L2 min	25	15	30	40	35	40	40
		L1 max	245	420	450	535	559	565	660
		L2 max	35	110	110	110	110	110	140
		L1 min	148	218	278	309	355	400	353
		tube size	50	50 / 76,2	70 / 90	90	120	120	140
CONNECTIONS (ØD-N-Ød)	DIN 	75-6-6 90-4-8	90-4-8 100-6-8 100-8-8 120-8-8 120-8-10	100-6-8 120-8-8 120-8-10 150-8-10 150-8-12	120-8-10 150-8-12 180-8-14	150-8-12 180-8-14 180-8-16 180-10-16	180-8-14 180-8-16 180-10-16 225-8-16	180-8-14 180-8-16 180-10-16 225-8-16 250-8-18	180-8-14 180-8-16 180-10-16 225-8-16 250-8-18
	SAE 	87-4-8	87-4-8 97-4-9,5 115-4-11,1	115-4-11,1 146-4-12,7	146-4-12,7	174,8-8-9,6 203,2-8-9,6 203,2-12-11,1	203,2-8-9,6 203,2-12-11,1	203,2-8-9,6 203,2-12-11,1 205-12-12,4	203,2-12-11,1 244,5-8-16,1 205-12-12,4
	Cross serration 		100-4-8,5 122-4-11	122-4-11	122-4-11	150-4-13 180-4-15	150-4-13 180-4-15	150-4-13 180-4-15	180-4-15



DIN with face key (w x k)		17800	20400
		225-8-17 (32x9)	225-8-17 (32x9) 250-8-19 (40x12,5)

Cardan Shafts

ACCESSORIES - CARDAN SHAFTS TYPE ACS

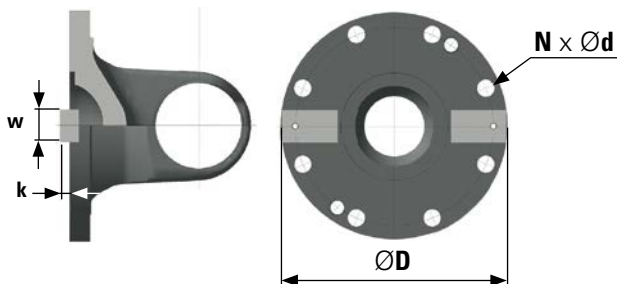
Revision number: T10155-01-D

Revision date: 01.02.2023

Series 4 and 5

Series			4					5		
Size			21510	22580	25080	28580	31510	35000	39000	44000
DESIGN	Bearing Torque	Nm	29.000	45.000	70.000	100.000	143.000	210.000	300.000	500.000
	Reversing Fatigue Torque	Nm	14.500	23.000	35.000	50.000	70.000	100.000	150.000	250.000
	Joint Performance Factor	Nm	8.350	12.050	19.650	26.200	35.000	40.300	56.800	81.500
	Swing Diameter	mm	220	225	250	285	315	350	390	440
	100 	L1 min	775	900	995	1.115	1.205	1.295	1.450	1.660
		L2 min	140	140	140	140	150	150	170	190
		tube size	150	160 / 170	180	200	215	245	273	324
	110 	L1 min	579	585	645	990	980	1.175	1.140	1.300
		L2 min	40	40	40	50	100	50	80	70
		L1 max	650	899	994	1.114	1.204	1.294	1.449	1.659
		L2 max	110	140	140	140	140	150	170	190
	130 	L1 min	538	615	680	760	890	950	1.040	1.250
		tube size	150	160 / 170	180	200	215	245	273	324
CONNECTIONS (ØD-N-Ød)	DIN 		225-8-16 250-8-18 285-8-20	225-8-16 250-8-18 285-8-20	250-8-18 285-8-20 315-8-22	285-8-20 315-8-22	315-8-22 350-10-22	350-10-22 390-10-24	390-10-24 435-10-27	435-10-27
	DIN with face key (w x k) 		225-8-17 (32x9) 250-8-19 (40x12,5) 285-8-21 (40x15)	225-8-17 (32x9) 250-8-19 (40x12,5) 285-8-21 (40x15)	250-8-19 (40x12) 285-8-21 (40x15)	285-8-21 (40x15) 315-10-23 (40x15)	315-10-23 (40x15) 350-10-23 (50x16)	350-10-23 (50x16) 390-10-25 (70x18)	390-10-25 (70x18) 435-16-28 (80x20)	435-16-28 (80x20) 480-16-31 (90x22,5)
	Hirth serration 							350-12-18 390-12-20	390-12-20 435-16-20	435-16-20 480-16-22

CONNECTIONS - with face KEY



ACCESSORIES - CARDAN SHAFTS TYPE ACS

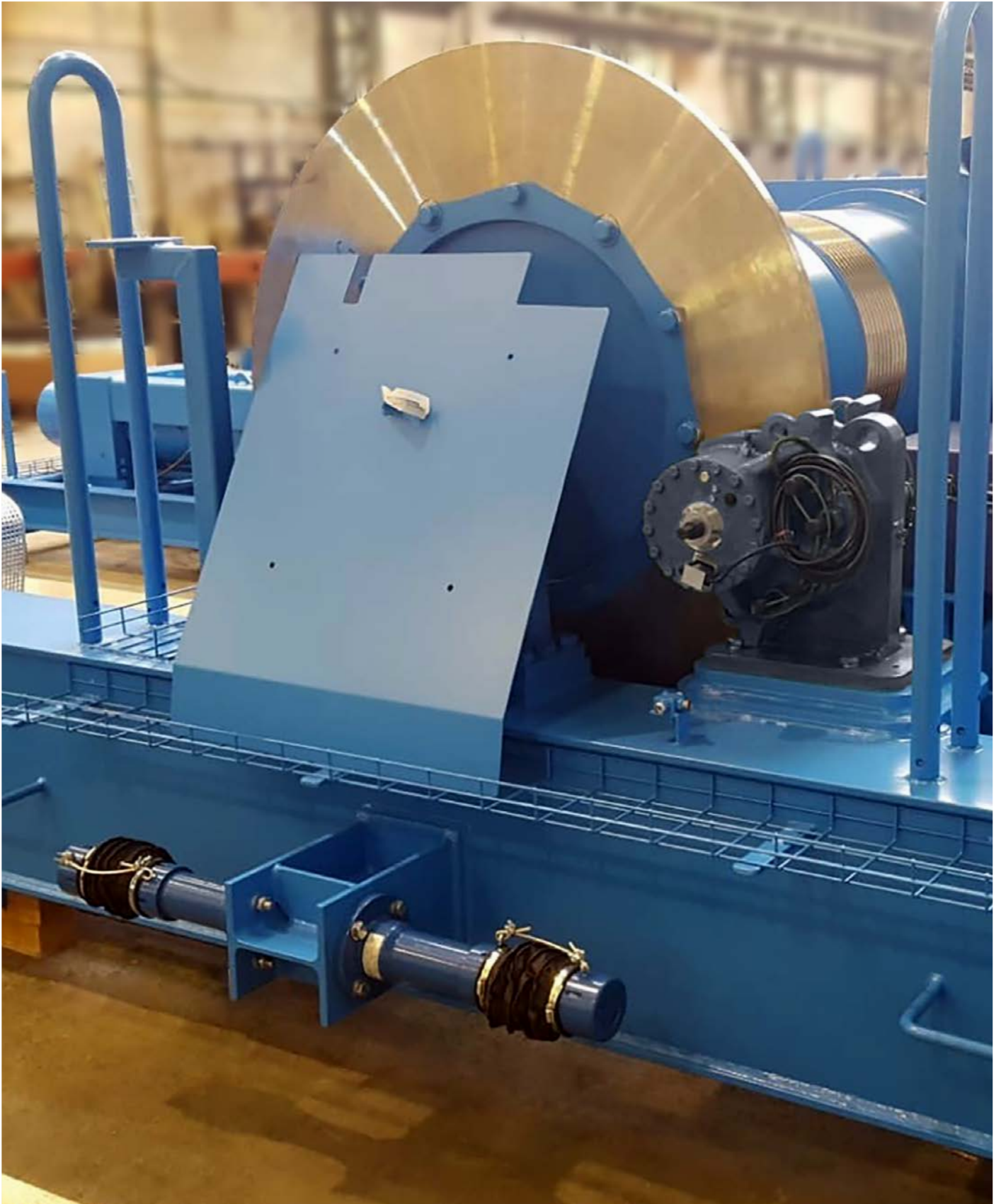
Revision number: T10155-01-D

Revision date: 01.02.2023

Series 5 and 6

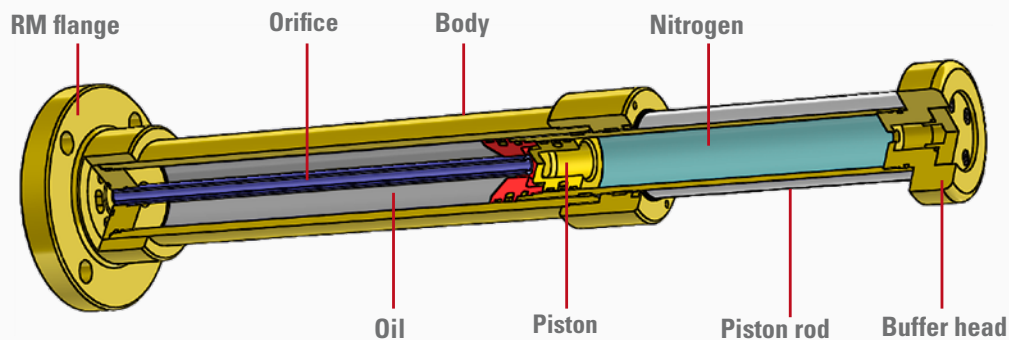
Series			5			6		
Size			49000	55000	62000	68000	75000	84000
DESIGN	Bearing Torque	Nm	700.000	1.000.000	1.250.000	1.950.000	2.650.000	3.900.000
	Reversing Fatigue Torque	Nm	345.000	500.000	625.000	950.000	1.650.000	1.850.000
	Joint Performance Factor	Nm	112.000	154.000	210.000	320.000	750.000	2.230.000
	Swing Diameter	mm	490	550	620	680	750	840
		L1 min	1.810	1.965	2.240			
		L2 min	190	240	250			
		tube size	355	406	445			
		L1 min	1.300	1.770	2.050			
		L2 min	50	55	55			
		L1 max	1.809	1.964	2.239			
		L2 max	190	240	250			
		L1 min	1.360	1.480	1.690			
		tube size	355	406	445			
		L1 min				3.250	4.000	4.250
		L2 min				250	250	250
		tube size				559	609	660
		L1 min				1.950	2.400	2.700
		tube size				559	609	660
CONNECTION (ØD-N-Ød)	DIN with face key (w x k) 		480-16-31 (90x22,5) 550-16-31 (100x22,5)	550-16-31 (100x22,5) 620-16-38 (100x25)	620-16-38 (100x25)			
	Hirth serration 		480-16-22 550-16-24	550-16-24 620-24-26	620-24-26 680-24-33	680-24-33	750-24-33	840-24-38

HYDRAULIC BUFFERS



MAIN CHARACTERISTICS	APPLICATIONS
• DAMPING DEVICES REQUIRING NO EXTERNAL ENERGY • DECELERATE MOVING MACHINES ALONG THE SHORTEST POSSIBLE PATH • SELF-ADJUSTMENT • 2 TYPES: REAR MOUNTING OR FRONT MOUNTING • FILLING: OIL / NITROGEN	• STEEL INDUSTRY • NUCLEAR CRANES • PORT APPLICATIONS • OVERHEAD CRANES - CONTAINER CRANES STACKER CRANES • TRANSFER CARS - RAILWAY APPLICATIONS

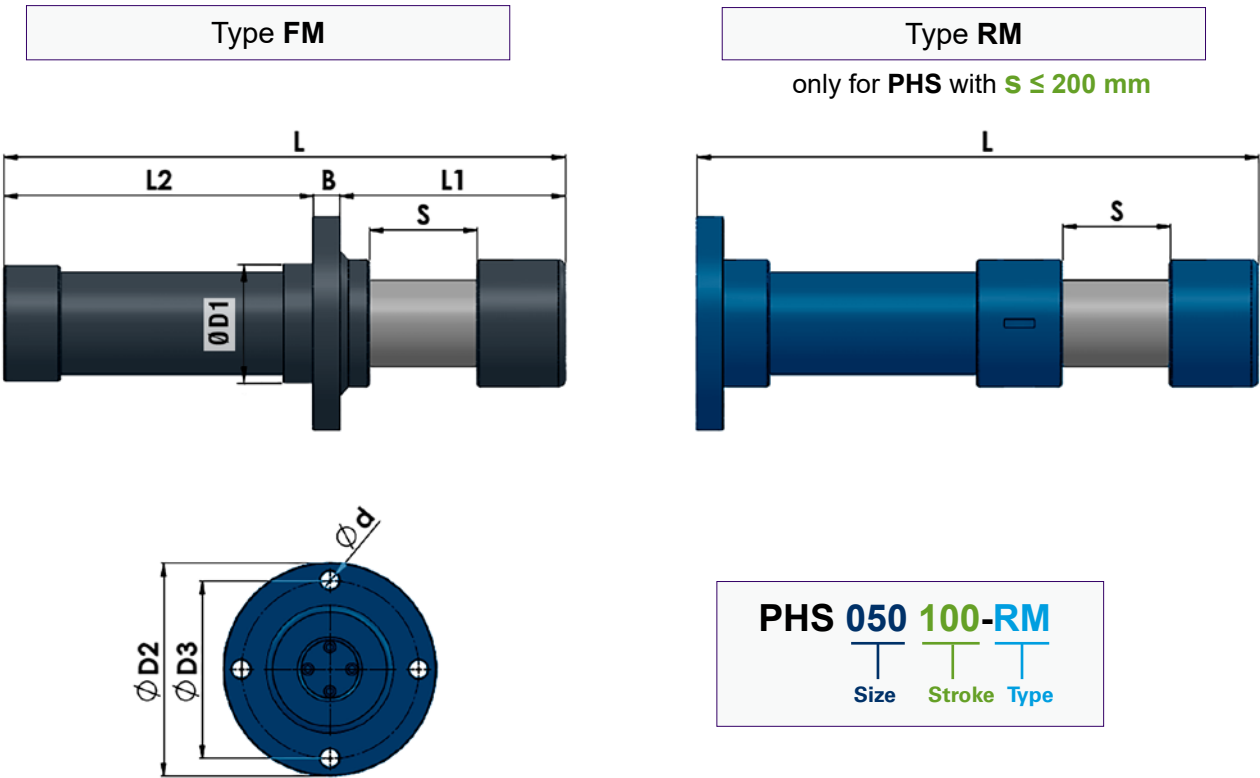
Coating & Options	
Temperature	-10 C à +80 C (standard) -40 C à +120 C (special)
Piston rod	Plasma coating (20 µ)
Body coating	Synthetic resin Color 80µM - standard: RAL5009 (Azure blue)
Options	Body coating: RAL1003 (signal yellow) RAL3020 (traffic red) RAL7021 (black grey) RAL9011 (graphite black) Safety chain Protection cover



ACCESSORIES - HYDRAULIC BUFFERS

Revision number: T10125-01-I

Revision date: 25.06.2024



Dimensions in mm	Weight (kg)		S	L	L1	L2	B	D1	D2	D3	d	W (kJ) Capacity/ Stroke	F (kN) Buffering Force
	FM	RM											
PHS 050 050	11	12	50	342	152	170	20	87	135	110	13	4,7	110
PHS 050 100	12	13	100	454,5	202	232,5	20	87	135	110	13	9,4	110
PHS 050 150	13	14	150	567	252	295	20	87	135	110	13	14,2	110
PHS 050 200	14	16	200	179,5	302	357,5	20	87	135	110	13	18,9	110

ACCESSORIES - HYDRAULIC BUFFERS

Revision number: T10125-01-I

Revision date: 25.06.2024

Dimensions in mm	Weight (kg)		S	L	L1	L2	B	D1	D2	D3	d	W (kJ) Capacity/ Stroke	F (kN) Buffering Force
	FM	RM											
PHS 063 050	14	15	50	343	152	171	20	91	168	135	17	8	170
PHS 063 100	15	16	100	455,5	202	233,5	20	91	168	135	17	15	170
PHS 063 150	17	17	150	568	252	296	20	91	168	135	17	23	170
PHS 063 200	18	19	200	680,5	302	358,5	20	91	168	135	17	30	170
PHS 063 250	19	20	250	793	352	421	20	91	168	135	17	38	170
PHS 063 300	21	22	300	905,5	402	483,5	20	91	168	135	17	46	170
PHS 063 350	22	23	350	1018	452	546	20	91	168	135	17	51	160
PHS 063 400	24	24	400	1130,5	502	608,5	20	91	168	135	17	54	150
PHS 063 450	25	26	450	1243	552	671	20	91	168	135	17	57	140
PHS 063 500	26	27	500	1355,5	602	733,5	20	91	168	135	17	59	130
PHS 063 550	28	29	550	1468	652	796	20	91	168	135	17	60	120
PHS 063 600	29	30	600	1580,5	702	858,5	20	91	168	135	17	60	110
PHS 063 650	31	31	650	1693	752	921	20	91	168	135	17	59	100
PHS 063 700	32	33	700	1805,5	802	983,5	20	91	168	135	17	57	90
PHS 063 750	34	34	750	1918	852	1046	20	91	168	135	17	54	80
PHS 063 800	35	36	800	2030,5	902	1108,5	20	91	168	135	17	51	70

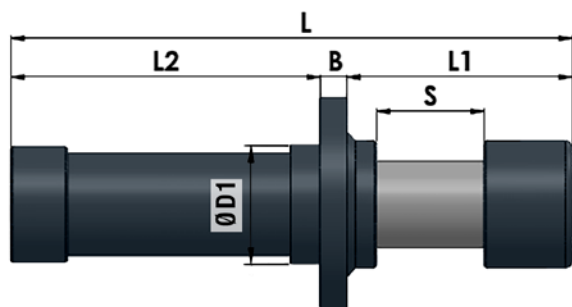
Dimensions in mm	Weight (kg)		S	L	L1	L2	B	D1	D2	D3	d	W (kJ) Capacity/ Stroke	F (kN) Buffering Force
	FM	RM											
PHS 080 050	24	26	50	410	159,5	225,5	25	110	198	165	17	13	260
PHS 080 100	26	28	100	522,5	209,5	288	25	110	198	165	17	23	260
PHS 080 150	28	30	150	635	259,5	350,5	25	110	198	165	17	35	260
PHS 080 200	30	32	200	747,5	309,5	413	25	110	198	165	17	48	260
PHS 080 250	32	34	250	860	359,5	475,5	25	110	198	165	17	59	260
PHS 080 300	34	36	300	972,5	409,5	538	25	110	198	165	17	68	250
PHS 080 350	36	38	350	1085	459,5	600,5	25	110	198	165	17	76	240
PHS 080 400	38	39	400	1197,5	509,5	663	25	110	198	165	17	84	230
PHS 080 450	40	41	450	1310	559,5	725,5	25	110	198	165	17	90	220
PHS 080 500	42	44	500	1422,5	609,5	788	25	110	198	165	17	95	210
PHS 080 550	44	45	550	1535	659,5	850,5	25	110	198	165	17	100	200
PHS 080 600	46	47	600	1647,5	709,5	913	25	110	198	165	17	104	190
PHS 080 650	48	49	650	1760	759,5	975,5	25	110	198	165	17	106	180
PHS 080 700	49	51	700	1872,5	809,5	1038	25	110	198	165	17	108	170
PHS 080 750	51	53	750	1985	859,5	1100,5	25	110	198	165	17	109	160
PHS 080 800	53	55	800	2097,5	909,5	1163	25	110	198	165	17	109	150

ACCESSORIES - HYDRAULIC BUFFERS

Revision number: T10125-01-I

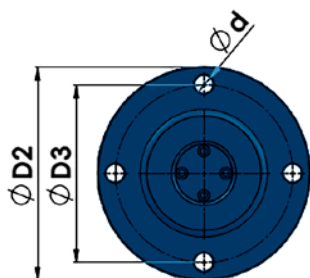
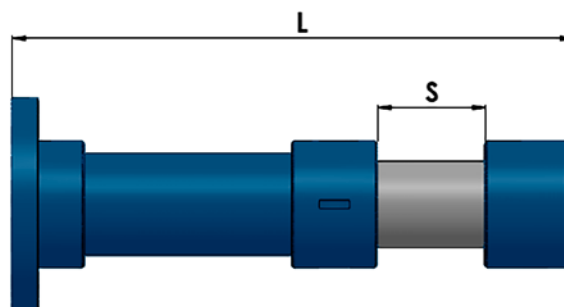
Revision date: 25.06.2024

Type FM



Type RM

only for PHS with $s \leq 200$ mm



PHS 100 100-RM
Size Stroke Type

Dimensions in mm	Weight (kg) FM RM		S	L	L1	L2	B	D1	D2	D3	d	W (kJ) Capacity/ Stroke	F (kN) Buffering Force
PHS 100 100	44	44	100	538,5	207	301,5	30	132	258	210	23	38	420
PHS 100 150	47	48	150	651	257	364	30	132	258	210	23	58	420
PHS 100 200	50	51	200	763,5	307	426,5	30	132	258	210	23	78	420
PHS 100 250	54	54	250	876	357	489	30	132	258	210	23	98	420
PHS 100 300	57	57	300	988,5	407	551,5	30	132	258	210	23	115	420
PHS 100 350	60	60	350	1101	457	614	30	132	258	210	23	132	420
PHS 100 400	63	63	400	1213,5	507	676,5	30	132	258	210	23	148	410
PHS 100 450	66	67	450	1326	557	739	30	132	258	210	23	161	400
PHS 100 500	69	70	500	1438,5	607	801,5	30	132	258	210	23	175	390
PHS 100 550	72	73	550	1551	657	864	30	132	258	210	23	190	380
PHS 100 600	76	76	600	1663,5	707	926,5	30	132	258	210	23	200	370
PHS 100 650	79	79	650	1776	757	989	30	132	258	210	23	210	360
PHS 100 700	82	82	700	1888,5	807	1051,5	30	132	258	210	23	220	350
PHS 100 750	85	85	750	2001	857	1114	30	132	258	210	23	230	340
PHS 100 800	88	89	800	2113,5	907	1176,5	30	132	258	210	23	240	330

ACCESSORIES - HYDRAULIC BUFFERS

Revision number: T10125-01-I

Revision date: 25.06.2024

Dimensions in mm	Weight (kg) FM RM		S	L	L1	L2	B	D1	D2	D3	d	W (kJ) Capacity/ Stroke	F (kN) Buffering Force
PHS 125 100	65	67	100	528,5	204,5	289	35	167	300	245	27	60	670
PHS 125 150	70	71	150	641	254,5	351,5	35	167	300	245	27	91	670
PHS 125 200	74	76	200	753,5	304,5	414	35	167	300	245	27	121	670
PHS 125 250	79	80	250	866	354,5	476,5	35	167	300	245	27	154	670
PHS 125 300	83	85	300	978,5	404,5	539	35	167	300	245	27	185	670
PHS 125 350	88	90	350	1091	454,5	601,5	35	167	300	245	27	215	670
PHS 125 400	92	94	400	1203,5	504,5	664	35	167	300	245	27	248	670
PHS 125 450	97	99	450	1316	554,5	726,5	35	167	300	245	27	275	650
PHS 125 500	102	103	500	1428,5	604,5	789	35	167	300	245	27	301	650
PHS 125 550	106	108	550	1541	654,5	851,5	35	167	300	245	27	325	630
PHS 125 600	111	112	600	1653,5	704,5	914	35	167	300	245	27	351	630
PHS 125 650	115	117	650	1766	754,5	976,5	35	167	300	245	27	377	630
PHS 125 700	120	122	700	1878,5	804,5	1039	35	167	300	245	27	393	610
PHS 125 750	125	126	750	1991	854,5	1101,5	35	167	300	245	27	414	610
PHS 125 800	129	131	800	2103,5	904,5	1164	35	167	300	245	27	435	590

Dimensions in mm	S	L	L1	L2	B	D1	D2	D3	d	W (kJ) Capacity/Stroke	F (kN) Buffering Force
PHS 150 100	100	528,5	204,5	289	35	192	325	270	31	86	860
PHS 150 150	150	641	254,5	351,5	35	192	325	270	31	129	860
PHS 150 200	200	753,5	304,5	414	35	192	325	270	31	172	860
PHS 150 250	250	866	354,5	476,5	35	192	325	270	31	215	860
PHS 150 300	300	978,5	404,5	539	35	192	325	270	31	258	860
PHS 150 350	350	1091	454,5	601,5	35	192	325	270	31	301	860
PHS 150 400	400	1203,5	504,5	664	35	192	325	270	31	344	865
PHS 150 450	450	1316	554,5	726,5	35	192	325	270	31	380	845
PHS 150 500	500	1428,5	604,5	789	35	192	325	270	31	415	830
PHS 150 550	550	1541	654,5	851,5	35	192	325	270	31	442	805
PHS 150 600	600	1653,5	704,5	914	35	192	325	270	31	474	790
PHS 150 650	650	1766	754,5	976,5	35	192	325	270	31	507	780
PHS 150 700	700	1878,5	804,5	1039	35	192	325	270	31	525	750
PHS 150 750	750	1991	854,5	1101,5	35	192	325	270	31	555	740
PHS 150 800	800	2103,5	904,5	1164	35	192	325	270	31	576	720



Stromag™

Regal Rexnord™

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