

Operating instructions for HAWE products

For intended use in explosive atmospheres



For the regulation areas

- EU: ATEX (Directive 2014/34/EU)
- International: IECEx
- USA: NEC, MSHA
- Canada: CEC
- Australia: ANZEx
- China: CCC, MA
- and others



(Translation of the original instructions)

B ATEX

11-2022 -3.5 en

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HYDRAULIK

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The fluid product has been designed, manufactured and tested using internationally applicable guidelines and harmonised standards, and left the HAWE plant in a safe and fault-free condition. To maintain this condition and ensure safe operation, operators must observe the information and warnings in this operating and maintenance manual.

The fluid-technical product must only be installed and integrated into a hydraulic system by a qualified technician, who is familiar with and works according to the generally accepted engineering standards and the latest legal regulations and standards of explosion protection. Furthermore, the special features of the application and/or operation environment must be carefully assessed and taken into account.

1.1 Use

In the ATEX directive 2014/34/EU, the fluid product is assigned to equipment group II category 2 and category 3 or equipment group I category M2 and can be used in zones 1, 2, 21, 22 in accordance with 1999/92/EC or in zone M2. The component is intended for use in areas where there are explosive gas/air and/or dust/air mixtures, mists or vapours.

In accordance with DIN 50020:2016 and ISO 80079-37:2016, the fluid product is assigned to the type of protection "c" with a maximum surface temperature of 135°C, or temperature class T4. The standard DIN EN 60079-0 VDE 0170-1 and the corresponding parts of this series of standards apply to the solenoids.

ATEX-compliant solenoids and displacement transducers may only be operated using product-specific operating and maintenance manuals and in the permissible ambient temperature range.

Around the world, other certificates and type examinations are regionally required in addition to ATEX. For a rough map see [Chapter 1.2, "Identification"](#).



For a more precise list of all order codings and the assigned classifications see [Chapter 3, "Order coding, classification and usage"](#).

1.2 Identification

Name and address of manufacturer

Headquarters

HAWE Hydraulik SE
 Einsteinring 17
 85605 Aschheim
 Germany
 e-mail: info@hawe.de
 www.hawe.com
 Phone: +49 (0) 89 / 37 91 00 - 1000

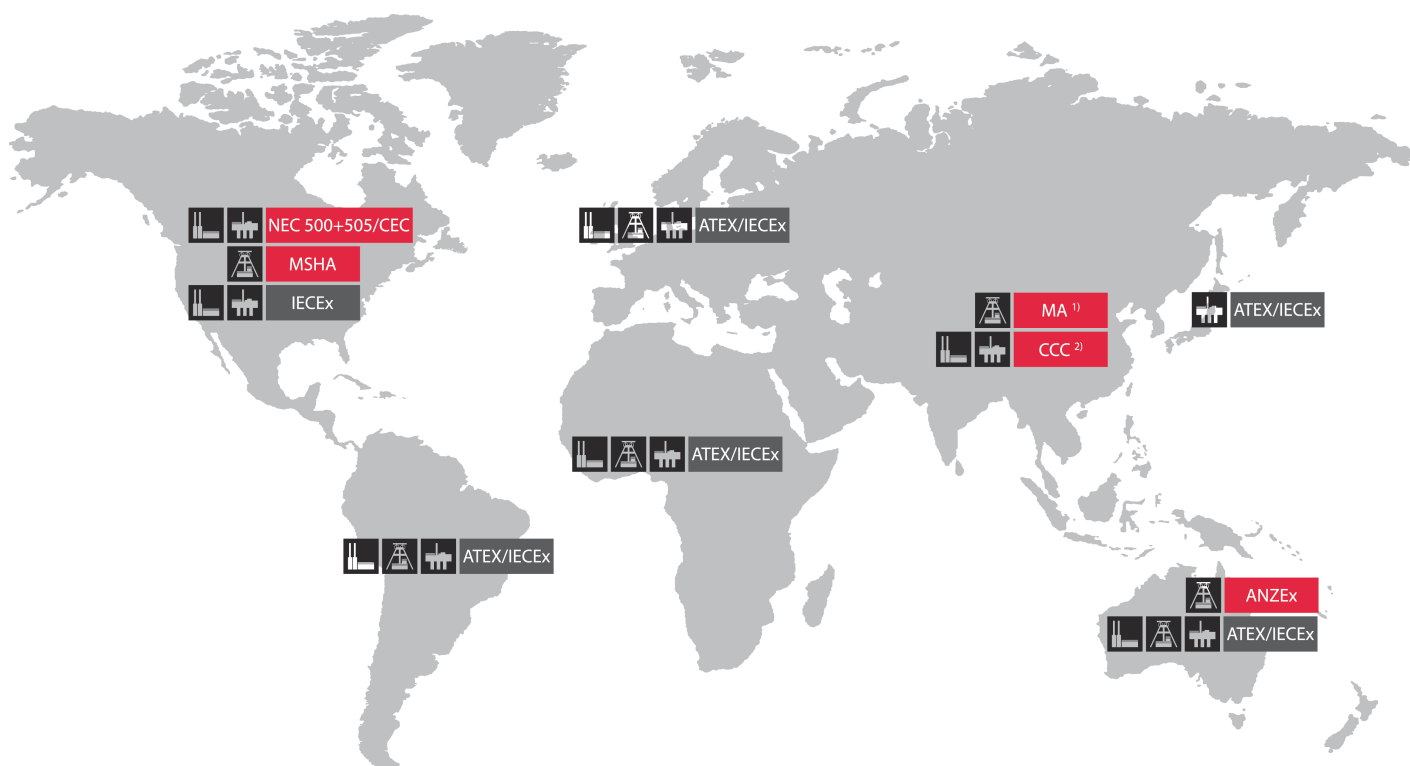
Device type and manufacturing date:

see type plate

Reference number for technical documentation:

on request

Regionally required application-specific certificates



Potentially explosive areas with gas and dust atmospheres

Mining applications

Oil & gas extraction

1) Generally, CCC approval is required to enter the Chinese market.

2) CCC certification on the basis of IECEx

The fluid product is to be attached to a level mounting surface. Commercially available, ATEX-compliant (if applicable) connecting elements (fittings, hoses, tubes, etc.) from reputable manufacturers should be used to integrate the product into the hydraulic system. The hydraulic system must be decommissioned and depressurised in line with regulations (particularly in the case of systems with hydraulic accumulators) before removing the product.

In this regard, also see the notes in [General operating manual for the assembly, initial operation and maintenance of hydraulic components and systems: B 5488](#).

2.1 Initial operation and settings

Operation of fluid-technical products is only permissible if installed according to mounting regulations. The device must be separately connected to ground in case dangerous potential differences occur (e.g. with insulated mounting) and if it is not guaranteed that the fluid-technical piping system will establish a reliable connection to those components that are connected to ground. The manufacturer will generally deliver the device with the settings applied. Alternatively, the customer can also apply or adjust these settings. In this case the customer must refer to the instructions provided in the valid documentation for the specific device.

In this regard, also see the notes in [General operating manual for the assembly, initial operation and maintenance of hydraulic components and systems: B 5488](#).

2.2 Maintenance, service and troubleshooting

The fluid-technical product requires almost no maintenance. All hydraulic connections must be checked regularly - at least once every year - for possible damages (visual check). In case of external leakage the system must be taken out of operation and repaired. The user has to make sure that possibly vaporised ingredients of the escaped pressure fluid do not cause any danger when blended with surrounding explosion hazardous atmosphere. The use of fire inhibiting fluids or mechanical shielding is recommended in such cases. The surface of the device must be checked regularly - at least once every year - for dust deposits, which should then be cleaned off.

The product-specific technical documentation specifies any other necessary maintenance work required to ensure safe and stable operation of the device. It is assumed that the generally known and applicable recommendations for service and operation of hydraulic systems are complied with.

In this regard, also see the notes in [General operating manual for the assembly, initial operation and maintenance of hydraulic components and systems: B 5488](#)

2.3 Safety notes

General

In addition to the EC Directive 2014/34/EU and its national implementations (the ProdSG (Product Safety Act) in Germany), operators must ensure compliance with the EG-Richtlinie 1999-92-EG (ATEX operational directive) and its implementations (the BetrSichV (Industrial Safety Regulation) in Germany).

Please observe the following

- Immediately shut down the device if a malfunction, corrosion or damage occurs.
- 70 °C is the maximum permissible hydraulic fluid temperature and must not be exceeded anywhere in the hydraulic system.
- The heat dissipation must not be impaired. Deposits on the surface must always be avoided where possible.
- The device must not be covered and must not be operated in the direct vicinity of heat sources.
- Sunlight must be avoided.

- The type plate or the type engraving must not be removed or rendered illegible.
- The type coding and the ATEX classification must not be removed.
- The device may not be coated without consulting the manufacturer.
- The cable must be installed in a fixed position with a minimum bending radius of 110 mm.
- Only install spare parts, e.g. solenoids, on ATEX-compliant devices with ATEX-compliant classification.
- Calculation of the duty cycle ED: Duty cycle (%) = $t_{\text{energised}} \text{ (s)} / t_{\text{cycle}} \text{ (s)}$ with $t_{\text{cycle max}} = 300 \text{ s}$

CAUTION

Burn hazard from hot surfaces and hydraulic fluid

A burn hazard results from directly or indirectly coming into contact with hot hydraulic fluid and hot components of the hydraulic system.



- ▶ Wear work gloves.
- ▶ Arrange the access to the hydraulic system in such a way that hot surfaces are not accessible to the user.
- ▶ Wait until the hydraulic system has cooled down before servicing or disassembling.

Single pumps, cover plate version and hydraulic power packs

In accordance with ISO 80079-36 and ISO 80079-37, in terms of content, moving parts which are protected by being immersed in a fluid are sufficiently protected against ignition from the atmosphere through the arrangement of a monitoring element (e.g. level gauge, level switch) that displays any non-permitted loss of protective fluid (this means pumps are to be operated in an oil-submerged arrangement). For improved safety, any non-permitted heating of the protective fluid is to be monitored by a temperature switch. Furthermore, for the self-installation of pumps in tank containers, an ATEX-compliant coupling must be used.

Pressure switches, directional seated valves and directional spool valves with electromechanical contact switches

The contact switches installed in pressure switches in accordance with [D 5440](#) and in directional seated valves and directional spool valves with switching position monitoring are simple electrical equipment in the sense of DIN EN 60079-11, subchapter 5.7, which do not have any special marking. In potentially explosive atmospheres they must be operated in an intrinsically safe circuit with isolation switch amplifier and are assigned to temperature class T6 in Group II in accordance with DIN 50020.

Hydraulic accumulators

Hydraulic accumulators do not have their own heat source. Their surface temperatures result from the mode of operation and the temperature of the hydraulic pressure medium. Based on the customer's specific operating specifications, the manufacturer carries out a check of the maximum surface temperature and thus compliance with the required temperature class on the finished product and it is documented.

Intrinsically safe devices

Devices with solenoid classification Ex d ib I comply with this only when supplied via an "ib" power supply unit of the equipment category M2.



The classification of the type of protection is only valid if it is not restricted through the use of the device with other components (e.g. on a hydraulic power pack or with integration into a complete system) and their lower classification. In this case, the lowest classification applies. If necessary, the operating instructions for the electromagnet and its ATEX classification must be observed.

Non-compliance with these operating instructions will void any warranty claims made against HAWE Hydraulik.

3 Order coding, classification and usage

3.1 Non-electrical part or purely mechanical component

Order coding	Certified according to	Classification	Certificate of unit approval	Declaration of conformity	Operating and maintenance manual	Permissible ambient temperature
...-EX	ATEX EU	Ⓢ II 2 G Ex h IIC T4 Gb Ⓢ II 2 D Ex h IIIC T135 °C Db ¹⁾		On request	B ATEX	-20°C to +40°C

1) See note Chapter 2.3, "Safety notes"

3.2 Displacement transducer for type PSL, PSV, PSM, PSLF, PSVF sizes 3 and 5

Explosion protection – explosive atmospheres of gas/air or dust/air mixtures, mists or vapours and firedamp protection – mining, mine gas and/or combustible dusts

Order coding	Certified according to	Classification	Certificate of unit approval	Operating instructions with declaration of conformity	Permissible ambient temperature
...-EX	ATEX EU	Ⓢ I M2 Ex db ib I Mb	IBExU09ATEX 1001 X	B ATEX, B 10/2008 (EX09)	-30 °C to +70 °C
		Ⓢ II 2G Ex db IIB T4 Gb			
		Ⓢ II 2D Ex tb IIIC T 135 °C Db			
	IECEX International	Ex db ib I Mb	IECEX IBE11.0004 X		
		Ex db IIB T4 Gb			
		Ex tb IIIC T135 °C Db			

3.3 Single-action solenoid for G(12), NG(1), VP 1, NBVP 16, NSWP 2, BVE 1, SWS 2

Explosion protection – explosive atmospheres of gas/air or dust/air mixtures, mists or vapours

Order coding	Certified according to	Classification	Certificate of unit approval	Operating and maintenance manual with declaration of conformity	Permissible ambient temperature															
...-X 24 EX 55 FM	ATEX EU	⊕ II 2G Ex db IIB+H2 T4 Gb	FM 18ATEX0019 X	B ATEX, B 40/2017 (EX22)	-40 °C to +55 °C The duty cycle ED [%] depends on the ambient temperature and the cable type being used.															
		⊕ II 2D Ex tb IIIC T135°C Db																		
	IECEX International	Ex db IIB+H2 T4 Gb	IECEX FMG 18.0007X	B ATEX, B 40/2017 (EX22)																
		Ex tb IIIC T135°C Db																		
	NEC	Class I Div. 1 Gp B,C,D T4	FM 18US0024 X	B ATEX, B 40/2017 (EX22)																
		Class II Div. 1 Gp E,F,G T4																		
		Class III Div. 1 & 2																		
		Class I Zone 1, AEx db IIB+H2 T4 Zone 21, AEx tb IIIC T135°C																		
	CEC	Ex db IIB+H2 T4 Gb	FM 18CA0012 X	B ATEX, B 40/2017 (EX22)																
		Ex tb IIIC T135°C Db																		
		Class I Div. 1 Gp B,C,D T4																		
		Class II Div. 1 Gp E,F,G T4																		
Class III Div. 1 & 2																				
					<table border="1"> <thead> <tr> <th colspan="3">Ambient temperature</th> </tr> <tr> <th>Cable type</th> <th>40 °C</th> <th>55 °C</th> </tr> </thead> <tbody> <tr> <td>90 °C</td> <td>Duty cycle 50%</td> <td>Duty cycle 25%</td> </tr> <tr> <td>105 °C</td> <td>Duty cycle 75%</td> <td>Duty cycle 50%</td> </tr> <tr> <td>125 °C</td> <td>Duty cycle 100%</td> <td>Duty cycle 100%</td> </tr> </tbody> </table>	Ambient temperature			Cable type	40 °C	55 °C	90 °C	Duty cycle 50%	Duty cycle 25%	105 °C	Duty cycle 75%	Duty cycle 50%	125 °C	Duty cycle 100%	Duty cycle 100%
Ambient temperature																				
Cable type	40 °C	55 °C																		
90 °C	Duty cycle 50%	Duty cycle 25%																		
105 °C	Duty cycle 75%	Duty cycle 50%																		
125 °C	Duty cycle 100%	Duty cycle 100%																		
					Definition of the duty cycle ED [%]: see the chapter "Safety Instructions "															

Explosion protection – mining, mine gas and/or combustible dusts

Order coding	Certified according to	Classification	Certificate of unit approval	Operating and maintenance manual with declaration of conformity	Permissible ambient temperature
...-G 24 M2FP	ANZEx Australia	Ex db I Mb	ANZEx12.4117 X	B ATEX, B 23/2011 (EX13)	-20 °C to +40 °C

3.4 Twin solenoid for type PSL, PSV, PSM, PSLF, PSVF sizes 3, 5 and 7

Explosion protection – explosive atmospheres of gas/air or dust/air mixtures, mists or vapours

Order coding	Certified according to	Classification	Certificate of unit approval	Operating and maintenance manual with declaration of conformity	Permissible ambient temperature
...-X 24 TEX 4 70 FM	ATEX EU	⊕ II 2G Ex db IIB T4 Gb	FM18ATEX0032X	B ATEX B 41/2017 (EX23)	-40 °C to +70 °C The duty cycle ED [%] depends on the ambient temperature and the cable type being used.
		⊕ II 2D Ex tb IIIC T135°C Db			
	IECEX International	Ex db IIB T4 Gb	IECEX FMG 18.0010X	B ATEX, B 41/2017 (EX23)	
		Ex tb IIIC T135°C Db			
	NEC	Class I Div. 1 Gp C,D T4	FM18US0089X	B ATEX B 41/2017 (EX23)	
		Class II Div. 1 Gp E,F,G T4			
		Class III Div. 1 & 2			
		Class I Zone 1, AEx db IIB T4 Zone 21, AEx tb IIIC T135°C			
	CEC	Ex db IIB T4 Gb	FM18CA0045	B ATEX B 41/2017 (EX23)	
		Ex tb IIIC T135°C Db			
Class I Div. 1 Gp C,D T4					
Class II Div. 1 Gp E,F,G T4					
Class III Div. 1 & 2					
...-G 24 EX	ATEX EU	⊕ II 2 G Ex mb IIC 120°C (T4) Gb	EPS 20 ATEX 1 100 X	B ATEX, B01 (EX01)	-35 °C to +40 °C
		⊕ II 2 D Ex mb IIIC T120°C Db			
	IECEX International	II 2G Ex mb IIC 120°C (T4) Gb	IECEX EPS 20.0042X		
		II 2D Ex mb IIIC T120°C Db			

Cable type	Ambient temperature		
	40 °C	55 °C	70 °C
90 °C	Duty cycle 100%	Duty cycle 50%	Duty cycle 25%
105 °C	Duty cycle 100%	Duty cycle 100%	Duty cycle 75%
125 °C	Duty cycle 100%	Duty cycle 100%	Duty cycle 100%

Definition of the duty cycle ED [%]: see the chapter "Safety Instructions "

Explosion protection – mining, mine gas and/or combustible dusts

Order coding	Certified according to	Classification	Certificate of unit approval	Operating and maintenance manual with declaration of conformity	Permissible ambient temperature
...-G 24 MSHA	ATEX EU	⊕ I M2 Ex db I Mb	IBExU05ATEX1115 X	B ATEX, B 04/2005 (EX05)	-20 °C to +40 °C
	IECEX International	Ex db I Mb	IECEX IBE 09.0004X		
	MSHA USA	30CFR Part 18 Cert. No. 18-NXA050003-0	18-NXA050003-0		
	MA China	EX db I Mb	MAJ22001J		
	CCC China	EX db I Mb	2020322307001535		
...-G 24 M2FP	ATEX EU	⊕ I M2 Ex db I Mb	IBExU05ATEX1115 X	B ATEX, B 04/2005 (EX05)	-20 °C to +40 °C
	IECEX International	Ex db I Mb	IECEX IBE 09.0004X		
	ANZEx Australia	Ex db I Mb	ANZEx 10.3019X		
...-G 12 IS	ATEX EU	⊕ I M1 Ex db ia I Ma	IBExU05ATEX1116 X	B ATEX, B 17/2011 (EX05)	-20 °C to +40 °C
	IECEX International	Ex db ia I Ma	IECEX IBE 09.0006X		
	MA China	Ex db ia I Ma	MAJ22002J		
	CCC China	Ex db ia I Ma	2020322307001535		
...-G 24 MA	MA China	EX db I Mb	MAJ22001J, SHExC21.2470	B ATEX, Q/HAWE 01-2021 (EX05)	-20°C to +40°C
	CCC China	EX db I Mb	2020322307001535		

3.5 Twin solenoid for PSL, PSV size 2

Explosion protection – explosive atmospheres of gas/air or dust/air mixtures, mists or vapours

Order coding	Certified according to	Classification	Certificate of unit approval	Operating and maintenance manual with declaration of conformity	Permissible ambient temperature
...-G 24 TEX 4 55 FM	ATEX EU	⊕ II 2G Ex db IIB T4 Gb	FM15ATEX0012X	B ATEX, B 28/2012 (EX04)	-40 °C to +55 °C
		⊕ II 2D Ex tb IIIC T135°C Db			
	IECEX International	Ex db IIB T4 Gb	IECEX FMG 15.0007X		
		Ex tb IIIC T135°C Db			
	NEC 500, NEC 505, CEC USA, Canada	NEC 500, CEC:	FM18US0246X, FM18CA0117X		
		▪ Class I, Div. 1, Grp B, C, D T4			
NEC 500:					
▪ Class II/III, Div. 1, Grp E, F, G T4					
NEC 505:	▪ Class I, Zone 1, AEx d, IIB T4 Gb				
NEC 506:	▪ Zone 21, AEx tb, IIIC T135°C Db				
CEC sect. 18:	▪ Class I, Zone 1, Ex db, IIB T4 Gb				
	▪ Zone 21, Ex tb IIIC T135°C Db				

Explosion protection – mining, mine gas and/or combustible dusts

Order coding	Certified according to	Classification	Certificate of unit approval	Operating and maintenance manual with declaration of conformity	Permissible ambient temperature
...-G 24 M2FP	ATEX EU	⊕ I M2 Ex db ib I Mb	IBExU13ATEX1087 X	B ATEX, B 25/2012 (EX03)	-20 °C to +40 °C
	IECEX International	Ex db ib I Mb	IECEX IBE 13.0045X		

3.6 Cable kits for single-action solenoid type ...-X 24 EX 55 FM and twin solenoid type ...-X 24 TEX 4 70 FM

Explosion protection – explosive atmospheres of gas/air or dust/air mixtures, mists or vapours

Solenoid designation	Material number of cable kit	Cable		Cable fitting			
		Designation	Temperature range	Designation	Certification and classification	Type test certificate	Operating instructions with declaration of conformity
Single-action solenoid ...-X 24 EX 55 FM	6217 0445-00	Radox 125 S2 3 G 0.75 (3 m)	Fixed cable: -40°C to +125°C	Capri ADE-1F2 ADE1N0501NPN	ATEX, EU: ⊕ II 2 G Ex db eb IIC ⊕ II 2 D Ex tb IIIC and IECEx, International: Ex db eb IIC Ex tb IIIC Ex e II Ex tD	<ul style="list-style-type: none"> for ATEX, EU: INERIS 12ATEX0032X for IECEx, International: IECEX INE 12.0025X 	CAP184249
	6217 0446-00	Radox 125 S2 3 G 0.75 (10 m)	Freely movable cable: -25°C to +125°C				
	6217 0447-00	MOR Polyrad XT-125 (3 m)	-40°C to +125°C				
	6217 0448-00	MOR Polyrad XT-125 (10 m)					
Twin solenoid ...-X 24 TEX 4 70 FM	6217 0441-00	Radox 125 S2 5 G 0.75 (3 m)	Fixed cable: -40°C to +125°C	Capri ADE-1F2 ADE1N0502NPN	ATEX, EU: ⊕ II 2 G Ex db eb IIC ⊕ II 2 D Ex tb IIIC and IECEx, International: Ex db eb IIC Ex tb IIIC Ex e II Ex tD	<ul style="list-style-type: none"> for ATEX, EU: INERIS 12ATEX0032X for IECEx, International: IECEX INE 12.0025X 	CAP184249
	6217 0442-00	Radox 125 S2 5 G 0.75 (10 m)	Freely movable cable: -25°C to +125°C				
	6217 0443-00	MOR Polyrad XT-125 (3 m)	-40°C to +125°C				
	6217 0444-00	MOR Polyrad XT-125 (10 m)					

Further information

HAWE Hydraulik SE is a responsible development partner with application expertise and experience in more than 70 areas of mechanical and plant engineering. The product range includes hydraulic power packs, constant and variable pumps, valves, sensors and accessories. Electronic components, ideally matched to hydraulic components, complement modular systems and facilitate control, signal evaluation and error detection. The intelligent system solutions reduce energy consumption and operating costs. Compact drives save space and permit innovative machine design.

The company is certified to ISO 9001, ISO 14001, ISO 45001, ISO 50001.



■ HAWE subsidiaries and service repair shops

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- Austria
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- Italy
- France
- Spain

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- China
- India
- Japan
- Korea
- Singapore
- Taiwan
- Australia

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