Brief operating manual for hydraulic power pack type MPN

acc. to pamphlet D 7207

CE

Attention: The compact hydraulic power pack has to be installed and connected by a qualified technician, who is familiar with and works according to the generally accepted engineering standards and the latest legal regulations and standards.

The data apply to radial piston and gear pumps

Electr. connection	Versions with plug Co. HARTING via cable 1,5 mm² Versions with integrated terminal box a cable gland M 20x1,5 is to be customer furnished
Protection class	IP 54 conf. DIN EN 60529 / IEC 60529, apply to the complete hydraulic power pack (as a reference protection class to pure electrical machinery)
Safety class	DIN VDE 0100 Safety class 1
Insulation	Design conf. DIN VDE 0110 • for mains with 4 or 3 conductors L1~L2-L3~PE (3~phase mains) with grounded neutral point up to 500 V AC nom. phase voltage conductor - conductor • for mains with 4 or 3 conductors L1~L2-L3 (3~phase mains) without grounded neutral point up to 300 V AC nom. phase voltage conductor - conductor • for 1~phase mains with 2 conductors L-N up to 300 V AC nom. voltage.

1. Motor versions

Type	Nom. voltage and circuitry U_N (V)	Mains frequency f (Hz)	Nominal power P_N (kW)	Speed n_N (rpm)	Nom. current I_N (A)	Start current ratio I_A / I_N	Power factor cos φ	Insulation material class
MPN 42	400/230 ⅄△ 460/265 ⅄△	50 60	2.1 2.5	2785 3380	4.9/8.4 4.8/8.3	4.8 5.4	0.87 0.88	B
MPN 44	400/230 ⅄△ 460/265 ⅄△	50 60	2.1 2.4	1360 1632	4.9/8.5 4.6/8.0	4.1 4.6	0.86 0.86	B
MPN 46	400/230 ⅄△ 460/265 ⅄△	50 60	3.0 3.6	2815 3410	6.4/11.0 6.3/11.3	5.7 6.2	0.88 0.89	B
MPN 48	400/230 ⅄△ 460/265 ⅄△	50 60	3.0 3.6	1370 1665	6.7/11.5 6.6/11.3	4.2 4.7	0.84 0.85	B
MPN 404	400/230 ⅄△ 460/265 ⅄△	50 60	4.2 5.0	1370 1660	9.2/16.0 6.6/11.3	5.0 5.6	0.88 0.89	B
MPNW 42 [1]	230 ⊥	50	1.5	2800	10.5	3.3	0.94	B
MPNW 44 [1]	230 ⊥	50	1.5	1375	10.1	3.3	0.94	B

[1]) The capacity of the operating capacitor (C_B) should be reduced by approx. 30%, when less than 75% of the hydraulic work ($p_{max} \cdot V_g$) is employed.

An operating capacitor is mandatory for the operation of type MPNW - not scope of delivery.

C_B	1 ~ 230V 50 Hz	1 ~ 110V 60 Hz
MPNW 42 [1])	40 µF	180 µF
MPNW 44 [1])	60 µF	250 µF

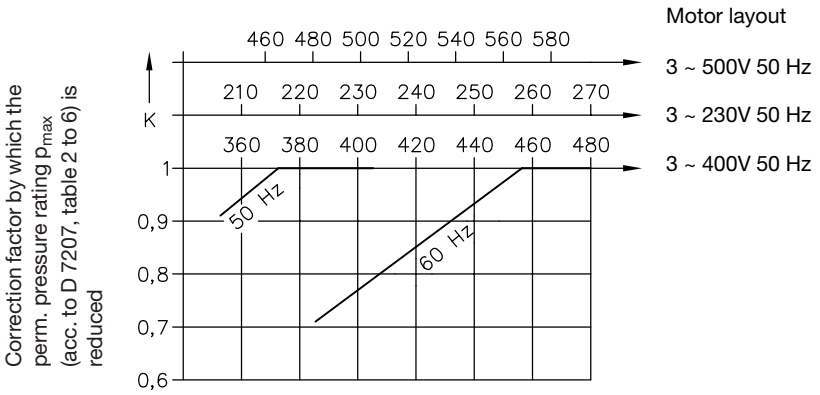
Voltage ranges

Operation with reduced supply voltage is possible, but see "Performance restrictions" on page 2!

Nom. voltage		Perm. mains voltage tolerances 50 Hz
Standard	3 ~ 400V 50 Hz 3 ~ 230V 50 Hz 1 ~ 230V 50 Hz 1 ~ 110V 60 Hz	± 10%
	3 ~ 460V 60 Hz	± 5%

Performance restrictions

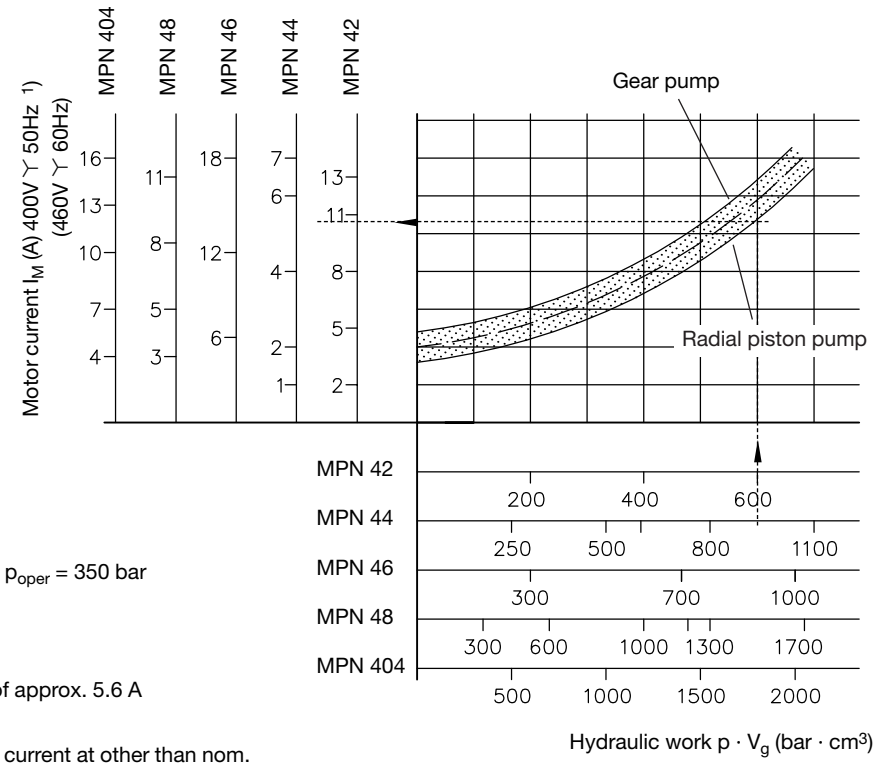
The table shows correction factors for reduced mains supply voltage. Take the correction factor for the lowest voltage anticipated.



2. Current consumption

The curves below are one a guideline. They serve to evaluate the current consumption to adjust the motor protective switch (safeguarding overload) and the heat generation to be anticipated.

Version for 3~phase mains



Example:

Selected pump MPN 44 - H 3,6

Operating pressure of the system p_{oper} = 350 bar

V_g = 2.58 cm³/rev.

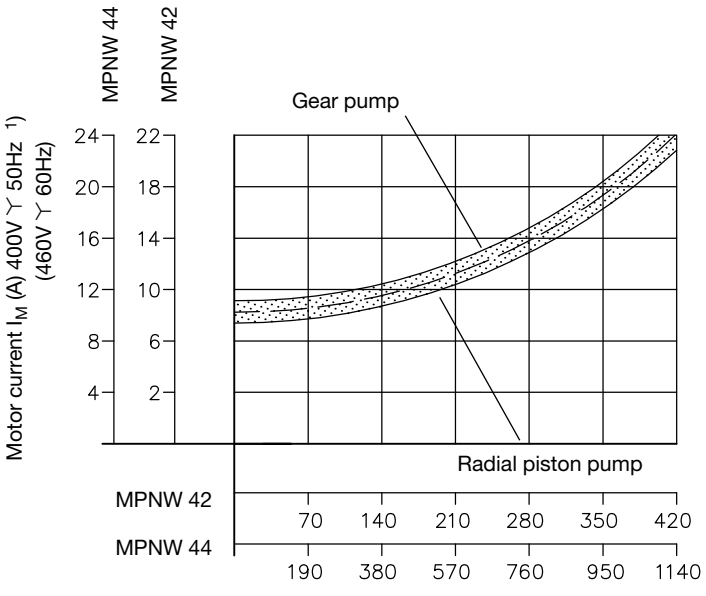
p · V_g = 903 bar · cm³

this results in a motor current I_M of approx. 5.6 A

[1)] Guideline values for the motor current at other than nom. voltage can be easily calculated e.g.:

Mains 230V 50Hz : $I_{230V} \approx I_{400V} \cdot \frac{400V}{230V}$

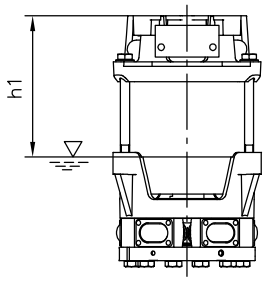
Mains 500V 50Hz : $I_{500V} \approx I_{400V} \cdot \frac{400V}{500V}$



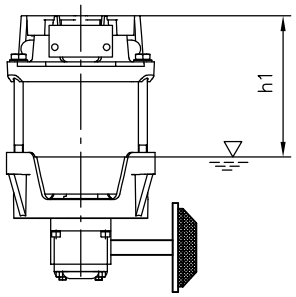
3. Notes for general lay-out and initial operation

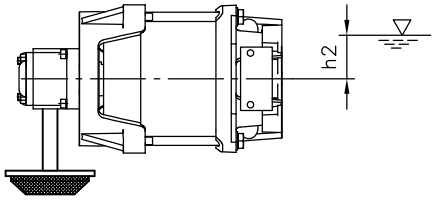
3.1 Installation in customer furnished tanks

The dimensions of a customer furnished tank should be selected in such a way that it is ensured that the motor is always oil immersed even when the max. required fluid volume is removed. This way the performance rating of the power pack can be completely exploited. The perm. performance is reduced if the motor contour is partially or completely above the fluid level. When more than ¼ of the motor is above the fluid level a no-load operation is no longer permissible but on/off service can be still provided. The thermal balance of the motor has to be checked (via resistance measurement acc. to VDE 0530) if the fluid level drops even further. This temperature (resistance) check has to be undertaken several times until no more temperature rise can be detected; always after a load sequence when the pump has performed some operation cycles. The perm. fluid temperature is approx. 80°C, the perm. winding temperature is approx. 130°C (isolation class B).).



The installed position of the pump is arbitrary, as long as the winding head is immersed below the fluid level h1.





The installed position of the pump is arbitrary, as long as all suction parts are immersed below the fluid level.

h2 = Dependent on size, gear pump and chosen suction part
(see dimensional drawings in D 7207, sect. 4 and 6)

	MPN 42 MPNW 42	MPN 44	MPN 46	MPN 48 MPNW 44	MPN 404
h1 (mm)	105	113	124	132	163
h2 (mm)	127	127	127	152	152

3.2 Direction of rotation

It is not necessary to observe the direction of rotation with type MPN...-H..., (flow direction will not change) whereas a certain direction of rotation is absolutely required for types MPN...-H...-Z and MPN...-Z. The rotation direction can't be detected in installed state (hydraulic power packs), but via checking the delivery flow. Procedure (gear pumps only): Direct the flow from port P (double pumps feature two ports P!) via a translucent hose back into the tank; Switch on/off the pump several times. When a flow is visible the direction is o.k. otherwise it has to be reversed by interchanging the connection of two of the three main wires of the motor (reversing the rotation direction). Try again! The pumps type MPN...-H...-Z and MPN...-Z rotate anti-clockwise (facing the drive shaft) in delivery state.

3.3 Filling up with hydraulic oil

The pressure fluid to top-up the power pack should have passed a system filter or be fed via a screen filter unit ≤ 0,4 mesh width). Only hydraulic fluids listed in pamphlet D 5488/1 are approved for use.

Pressure fluid Hydraulic oil conf. DIN 51 524 part 1 to 3, ISO VG 10 to 68 conf. DIN 51 519
Viscosity range min. approx. 4; max. approx. 1500 mm^2/s
Opt. service: approx. 10 ... 500 mm^2/s
Also suitable are biologically degradable pressure fluids type HEES (synth. Ester) at service temperature up to approx. +70 °C. Electrically hazardous: Any fluid types containing water (HEPG,HETG etc.) must not be used (short-cut)!

3.4 Initial operation and bleeding

The three pump cylinders will be bled automatically if the pump runs or is switched on and off several times and the connected directional valves are switched into a switching position where idle circulation is provided, if possible with your circuitry.
Another way is to install a pipe fitting with a short piece of pipe and prolonged by a translucent tube. The other end of the tube should be put into the filler neck, held firmly and sealed with a non-fluffing cloth. Now switch on the pump and let it run until no more bubbles are visible. Next after the pump cylinders are bled any air dragged into the system should be removed by opening the bleeder screws at the consumers (if provided) until no more bubble are detected or by operating all functions of the circuitry without load until all cylinders, motors, etc. move steadily and without any hesitation.

3.5 Adjustment of the protective motor switch

The protective motor switch has to be adjusted in such a manner, that too early triggering is avoided during undisturbed operation and operation cycles permanently succeeding one another. Whereas it should safeguard the motor against over heating in case of stand-still due to a pressure limiting valve being adjusted to high, malfunction of a pressure switch which should trigger a stop signal etc. This means the protective switch should be set that it responds even before the perm .winding temperature is reached. Guideline for proper setting of the protective switch: I_E should be 0.7 I_M in general, 0.65 I_M for operation in the range of p_{max} and 0.8 I_M for low loads.

3.6 Additional functions

Temperature switch

Technical data:
Bimetallic switch Co. MICROTHERM
T10V 80°C ±5K U112 P102 L510-NC-contact
AC: 250 V 50/60 Hz 3.5 A; DC: 42 V 1 A

Signaling takes place at	80°C ± 5K (Kelvin)
Max. voltage	250V 50/60 Hz
Nom. current (cos φ ~ 0.6)	1.6 A
Max. current at 24V DC	1.5 A

Connection – in the terminal box / plug Co. HARTING

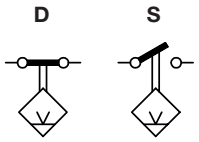
Note: The temperature switch is integrated in the winding at 1~phase motors i.e. winding protective switch

Float switch

Technical data:

Switching performance DC/AC	60 W/ 60 VA
max. current DC/AC	0.8 A (cos φ =1)
max. voltage	230 V 50/60 Hz

A protective circuitry is mandatory at inductive loads



Connection via separate plug (DIN 43650-C, 8 mm)

For electr. connection, see sect. 4

3.7 Servicing

The hydraulic power packs type MP and the valves being directly mounted onto the hydraulic power pack are almost maintenance free. Only the fluid level should be checked regularly depending on operation conditions. The fluid should be exchanged every year as a general rule, but more frequently if tests show aging or contamination.

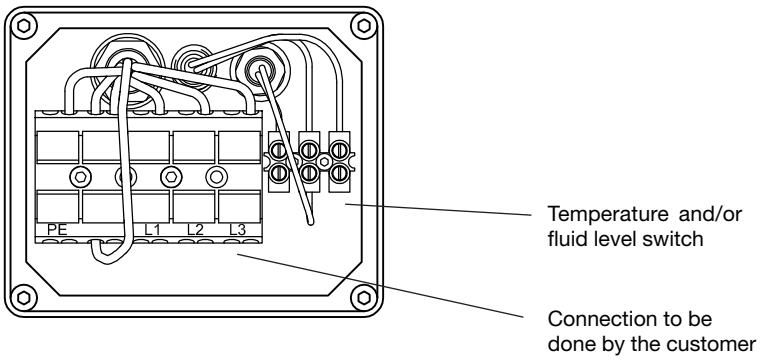
3.8 Spare parts

Repairs (replacing service items) are possible by competent craftsmen. The motor can't be repaired or replaced by the customer. Therefore if the motor is defect, the complete pump should be returned to our facilities for an overhaul. There are spare parts lists available, pls. state your pump type acc. to the type plate either on the pump or on the cover plate.

4. Electrical connection

Electric

Terminal box

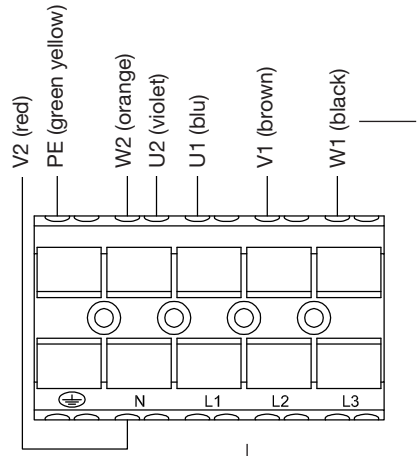


Version for 3~phase mains

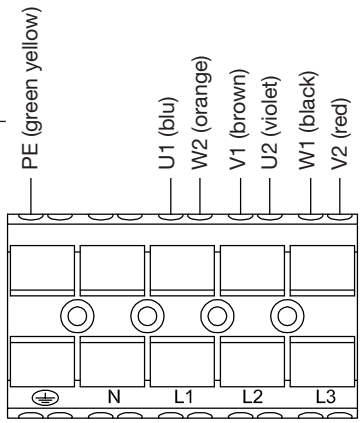
3~phase motor

The power supply has to be connected by the customer via leads L1, L2 and L3, and protective conductor PE. The genuine circuitry has to be altered when converting from ⅄ to Δ -circuitry.

⅄-3~phase motor



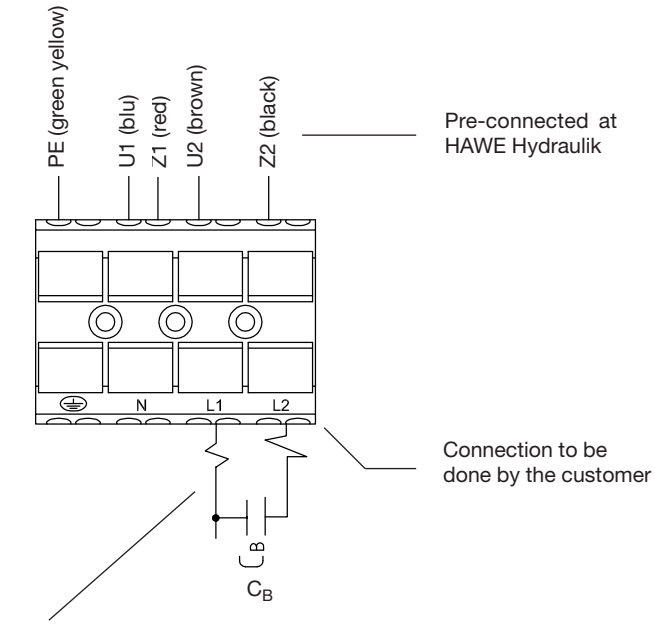
Δ-3~phase motor



Pre-connected at HAWE Hydraulik

Connection to be done by the customer

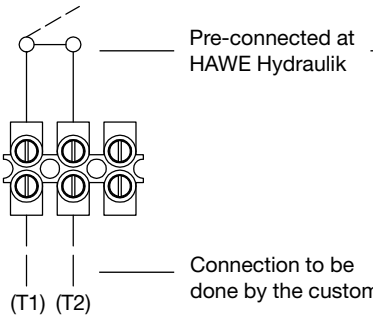
Version for 1~phase mains



An operating capacitor is mandatory for the operation of type MPNW - not scope of delivery.

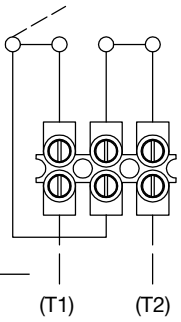
Temperature or
fluid level switch

D(S) or T



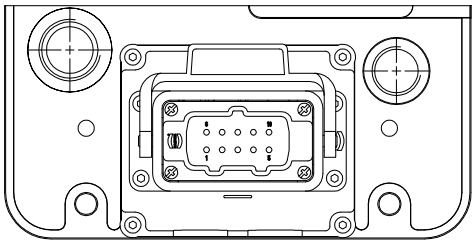
Temperature or
fluid level switch

D(S)T



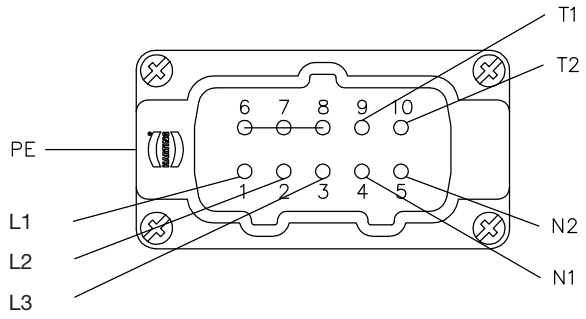
Plug Co. HARTING

Terminal box

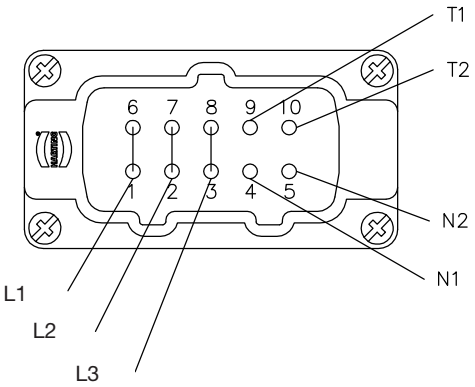


Y-3~phase motor

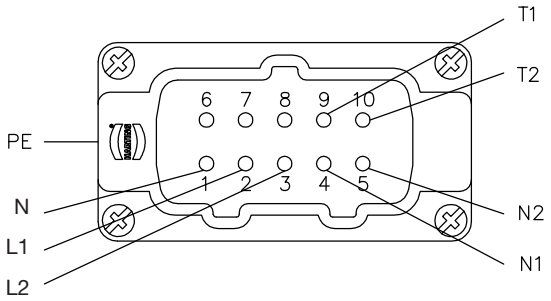
Y-3~phase motor



Δ-3~phase motor



Version for 1~phase mains



HAWE
HYDRAULIK

Solutions for a World under Pressure

Einbauerklärung einer unvollständigen Maschine - Original

nach Maschinenrichtlinie 2006/42/EG, Anhang II B

Declaration of incorporation of partly completed machinery – original

according to machinery directive 2006/42/EC, Annex II B

Hersteller: *Manufacturer:*	HAWE Hydraulik SE Einsteinring 17 DE-85609 Aschheim/München

Die alleinige Verantwortung für die Ausstellung dieser Einbauerklärung trägt der Hersteller.
This declaration of incorporation is issued under the sole responsibility of the manufacturer.

Unvollständige Maschine: *Partly completed machinery:*	**Typ MPN(W) nach unserer Dokumentation D 7207** *Type MPN(W) according to our documentation D 7207*
Die folgenden grundlegenden Sicherheits- und Gesundheitsschutzanforderung der Richtlinie 2006/42/EG kommen zur Anwendung: *The following essential health and safety requirements of Directive 2006/42/EC apply:*	**Abschnitte (chapters) 1.1.2, 1.1.3, 1.1.5, 1.2 komplett (complete), 1.3.1, 1.3.2, 1.3.4, 1.3.6, 1.3.7, 1.5.1, 1.5.2, 1.5.3, 1.5.4, 1.5.5, 1.5.6, 1.5.8, 1.5.9, 1.5.16, 1.6.3, 1.7.1, 1.7.3, 1.7.4 und 1.7.4.3.**
Es wurden folgende harmonisierte Normen oder andere technische Spezifikationen zugrunde gelegt: *The following harmonized standards or other technical specifications have been applied:*	**DIN EN ISO 12100:2011-03**
Dokumentationsbevollmächtigter: *Person authorised to compile the technical file:*	HAWE Hydraulik SE Abt. Produktmanagement Einsteinring 17 D-85609 Aschheim/München

Die speziellen technischen Unterlagen nach Anhang VII Teil B wurden erstellt.
The relevant technical documentation is compiled in accordance with part B of Annex VII.

Der Hersteller verpflichtet sich, die speziellen technischen Unterlagen zur unvollständigen Maschine einzelstaatlichen Stellen auf Verlangen elektronisch zu übermitteln.
The manufacturer undertakes to electronically transmit the special technical documents on the partly completed machinery to national authorities on request.

Die unvollständige Maschine darf erst dann in Betrieb genommen werden, wenn festgestellt wurde, dass die Maschine, in die die unvollständige Maschine eingebaut werden soll, den Bestimmungen der Richtlinie 2006/42/EG entspricht.
The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of the directive 2006/42/EG.

Aschheim, 2022-08-05

Axel Schwerdtfeger, CTO

Dogan Basöz, Product Manager

HYDRAULIK

Solutions for a World under Pressure

EU- Konformitätserklärung - Original
EU Declaration of conformity - original

Hersteller: *Manufacturer:*	HAWE Hydraulik SE Einsteinring 17 DE-85609 Aschheim/München

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.
This declaration of conformity is issued under the sole responsibility of the manufacturer.

Produkt: *Product:*	Typ MPN(W) nach unserer Dokumentation D 7207 *Type MPN(W) acc. to our documentation D 7207*
Gegenstand der Erklärung: *Object of the declaration:*	Unterölmotor des Hydraulikaggregates *Immersed Motor of hydraulic power pack*
Der oben beschriebene Gegenstand der Erklärung erfüllt die einschlägigen Harmonisierungsrechtsvorschriften der EU: *The object of the declaration described above is in conformity with the relevant European Union harmonization legislation:*	**2014/35/EU**
Es wurden folgende harmonisierte Normen oder andere technische Spezifikationen zugrunde gelegt: *The following harmonized standards or other technical specifications have been applied:*	**DIN EN 60204-1 VDE0113-1:2019-06**

Aschheim, 2022-08-05

Axel Schwerdtfeger, CTO

Dogan Basöz, Product Manager

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Europäische Aktiengesellschaft (SE) . Sitz der Gesellschaft: München . USt ID Nr: DE180016108 . Registergericht München HRB 174760
Vorstand: Robert Schullan, Axel Schwerdtfeger, Wolfgang Sochor, Markus Unterstein, Jiang Ye
Vorsitzender des Aufsichtsrats: Karl Haeusgen
Hypo-Vereinsbank München, 1780008454 (BLZ 700 202 70), IBAN DE53 7002 0270 1780 0084 54, BIC HYVEDEMMXXX
Commerzbank München, 150623700 (BLZ 700 400 41), IBAN DE56 7004 0041 0150 6237 00, BIC COBADEFFXXX
Baden-Württembergische Bank, 2368049 (BLZ 600 501 01), IBAN DE90 6005 0101 0002 3680 49, BIC SOLADEST
Bayerische Landesbank, 203693428 (BLZ 700 500 00), IBAN DE86 7005 0000 0203 6934 28, BIC BYLADEMMXXX

HAWE HYDRAULIK

Solutions for a World under Pressure

Declaration of incorporation of partly completed machinery – original

according to Supply of Machinery (Safety) Regulations 2008, 2008 No. 1597, annex II B

Einbauerklärung einer unvollständigen Maschine - Original

nach Supply of Machinery (Safety) Regulations 2008, 2008 No. 1597, Anhang II B

Manufacturer: *Hersteller:*	HAWE Hydraulik SE Einsteinring 17 DE-85609 Aschheim/München

This declaration of incorporation is issued under the sole responsibility of the manufacturer.
Die alleinige Verantwortung für die Ausstellung dieser Einbauerklärung trägt der Hersteller.

Partly completed machinery: *Unvollständige Maschine:*	**Type MPN(W) acc. to our documentation D 7207** *Typ MPN(W) nach unserer Dokumentation D 7207*
The following essential health and safety requirements of Directive 2008 No. 1597 apply: *Die folgenden grundlegenden Sicherheits- und Gesundheitsschutzanforderung der Richtlinie 2008 No. 1597 kommen zur Anwendung:*	***Chapters (Abschnitte) 1.1.2, 1.1.3, 1.1.5, 1.2 complete (komplett), 1.3.1, 1.3.2, 1.3.4, 1.3.6, 1.3.7, 1.5.1, 1.5.2, 1.5.3, 1.5.4, 1.5.5, 1.5.6, 1.5.8, 1.5.9, 1.5.16, 1.6.3, 1.7.1, 1.7.3, 1.7.4 and 1.7.4.3.***
The following designated standards or other technical specifications have been applied: *Es wurden folgende harmonisierte Normen oder andere technische Spezifikationen zugrunde gelegt:*	**DIN EN ISO 12100:2011-03**
Person authorised to compile the technical file: *Dokumentationsbevollmächtigter:*	Koppen & Lethem Ltd 3 Glenholm Park, Brunel Drive Newark | Nottinghamshire | NG24 2EG United Kingdom

The relevant technical documentation is compiled in accordance with part B of Annex VII.
Die speziellen technischen Unterlagen nach Anhang VII Teil B wurden erstellt.

The manufacturer undertakes to electronically transmit the special technical documents on the partly completed machinery to national authorities on request.
Der Hersteller verpflichtet sich, die speziellen technischen Unterlagen zur unvollständigen Maschine einzelstaatlichen Stellen auf Verlangen elektronisch zu übermitteln.

The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of the directive 2008 No. 1597.
Die unvollständige Maschine darf erst dann in Betrieb genommen werden, wenn festgestellt wurde, dass die Maschine, in die die unvollständige Maschine eingebaut werden soll, den Bestimmungen der Richtlinie 2008 No. 1597.

Aschheim, 2022-08-05

Axel Schwerdtfeger, CTO

Dogan Basöz, Product Manager

HAWE HYDRAULIK

Solutions for a World under Pressure

UKCA-Declaration of conformity - original

UKCA Konformitätserklärung - Original

Manufacturer: *Hersteller:*	HAWE Hydraulik SE Einsteinring 17 DE-85609 Aschheim/München

This declaration of conformity is issued under the sole responsibility of the manufacturer.
Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.

Product: *Produkt:*	**Type MPN(W) acc. to our documentation D 7207** *Typ MPN(W) nach unserer Dokumentation D 7207*
Object of the declaration: *Gegenstand der Erklärung*	Immersed Motor of hydraulic power pack *Unterölmotor des Hydraulikaggregates*
The object of the declaration described above complies with the relevant designated standards of the United Kingdom: *Der oben beschriebene Gegenstand der Erklärung erfüllt die einschlägigen Harmonisierungsrechtsvorschriften des UK:*	**Electrical Equipment (Safety) Regulations 2016 No. 1101**
The following designated standards or other technical specifications have been applied: *Es wurden folgende harmonisierte Normen oder andere technische Spezifikationen zugrunde gelegt:*	**EN 60204-1:2018**
Person authorised to compile the technical file: *Dokumentationsbevollmächtigter:*	Koppen & Lethem Ltd 3 Glenholm Park, Brunel Drive Newark | Nottinghamshire | NG24 2EG United Kingdom

Aschheim, 2022-08-05

Axel Schwerdtfeger, CTO

Dogan Basöz, Product Manager