HAWE HSE 16-3 hydraulic clamping cylinder, 16 mm piston, 3 mm stroke

Manufacturer: HAWE Hydraulik

Manufacturer part number / published order designation: HSE 16-3

Published model: HSE 16-3

About this compilation

Prepared by Hydmaster from selected manufacturer documentation. Original technical pages follow without cropped drawings, rewritten data or altered units. This cover and index are Hydmaster editorial material, not a manufacturer-issued exact-execution datasheet.

Coverage: selected pages relevant to the identified size and configuration. Other options or neighbouring models retained on an original page apply only where explicitly identified.

Source-page index

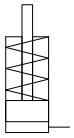
Source page numbers below are physical pages of each complete original PDF. The original printed page labels and technical content remain unchanged. Compiled page numbers count this cover/index.

Source A: Hawe Hse Hsa Clamping Cylinders

Original pages	Compiled pages	Relevant content
5-11	2-8	Exact bore/stroke/spring-return and mounting-seal row. Published execution: HSE 16-3.; Default seal definition and optional PYD/AT compatibility restrictions.; Fluid, viscosity, cleanliness, temperature, installation and pressure limits with seal conditions.; Exact model mass row.; Force/pressure curves for the actual piston diameter, with test viscosity.; Actual HSE screw-in body and exact size/thread/sealing-seat row.; Actual HSE installation-bore tolerances, thread and sealing seat.
13-15	9-11	Installation, commissioning and intended use instructions.; Operating configuration and maintenance.; Lateral piston-load prohibition, mounting orientation and maintenance planning.

2 Available versions

Circuit symbols



Ordering examples

HSE 12-2 HSA 32-20	- AT

2.2 "Seals"

2.1 "Basic type and size"

2.1 Basic type and size

Type	Piston diameter ∅ (mm)	Lift (mm)	Spring return pressure (bar)		Seal
			extending	retracting	
Screw-in cylinder					
HSE 12-2	12	2	6	3	Sealing edge
HSE 12-5		5	6.5	3	Sealing ring 20x24x1.5 DIN 7603-Cu
HSE 12-8		8	5	2	
HSE 16-3	16	3	5.5	3	Sealing edge
HSE 16-8		8	7	3.5	Sealing ring 24x29x2 DIN 7603-Cu
HSE 16-12		12	6.5	3.5	
HSE 20-4	20	4	6	3.5	Sealing edge
HSE 20-10		10	7	3	Sealing ring 30x36x2 DIN 7603-Cu
HSE 20-15		15	5.7	2.5	
HSE 20-20		20	6.5	2.5	
HSE 24-5	24	5	6	4.5	O-ring 37x2.5 NBR 90 Sh and steel supporting ring
HSE 24-15		15	7	3.5	
HSE 24-20		20	6	4	
Screw-on cylinder					
HSA 32-20	32	20	5	1	O-ring 34x3 NBR 90 Sh
HSA 40-25	40	25	4.5	1	O-ring 44x5 NBR 90 Sh

NOTICE

During the return stroke, the return spring generates the specified theoretical pressure. This is also the minimum pressure required to push out the piston.

2.2 Seals

Coding	Description
Without coding	Series, NBR or AU seals, e.g. for mineral oil and HEES (synthetic ester)
PYD	FKM seals
AT	EPDM seals e.g. for glycol-based brake fluids (DOT4)

3 Parameters

3.1 General data

Designation	Single-acting plunger cylinder with spring return
Design	Hydraulic clamps
Model	▪ HSE: Screw-in version ▪ HSA: Manifold mounting
Installation position	As desired
Material	▪ Housing: steel/electro-galvanised ▪ Plunger piston with internal stop: Steel/hardened and ground
Attachment	Screw in or screw on depending on the design see Chapter 4, "Dimensions"
Tightening torque	see Chapter 4, "Dimensions"
Hydraulic fluid	Hydraulic fluid, according to DIN 51524 Parts 1 to 3; ISO VG 10 to 68 according to DIN ISO 3448 Viscosity range: 4 - 1500 mm^2/s Optimal operating range: approx. 10 - 500 mm^2/s For standard seal (without coding): Also suitable for biologically degradable hydraulic fluids type HEPG (polyalkylene glycol) and HEES (synthetic ester) at operating temperatures up to approx. +70°C. For seals with AT or PYD coding, see D 5488/1
Cleanliness level	**ISO 4406** 21/18/15...19/17/13
Temperatures	Environment: approx. -40 to +80 °C, hydraulic fluid: -25 to +80 °C, pay attention to the viscosity range. Start temperature: down to -40 °C is permissible (take account of the start viscosities!), as long as the steady-state temperature is at least 20 K higher during subsequent operation. Biologically degradable hydraulic fluids: note manufacturer specifications. With consideration for the seal compatibility, not above +70°C.

3.2 Pressure and volumetric flow

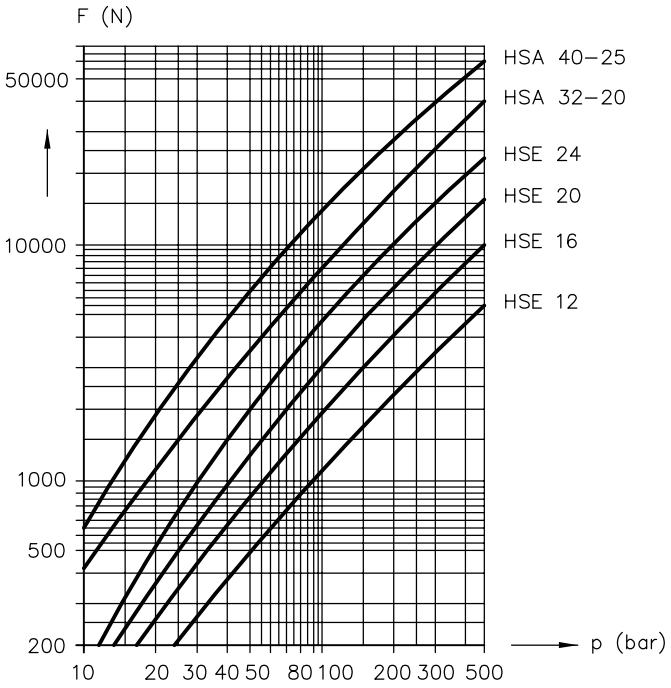
Operating pressure	p_{max} = 500 bar For seals with -PYD or -AT coding, the maximum operating pressure is limited to 250 bar.

3.3 Weight

Screw-in cylinder	**Type**	
	HSE 12-2	= 0.05 kg
	HSE 12-5	= 0.06 kg
	HSE 12-8	= 0.08 kg
	HSE 16-3	= 0.08 kg
	HSE 16-8	= 0.09 kg
	HSE 16-12	= 0.12 kg
	HSE 20-4	= 0.14 kg
	HSE 20-10	= 0.20 kg
	HSE 20-15	= 0.25 kg
	HSE 20-20	= 0.30 kg
	HSE 24-5	= 0.25 kg
	HSE 24-15	= 0.40 kg
	HSE 24-20	= 0.50 kg
Screw-on cylinder	**Type**	
	HSA 32-20	= 1.60 kg
	HSA 40-25	= 2.50 kg

3.4 Characteristic lines

Viscosity of the hydraulic fluid approx. 50 mm²/s



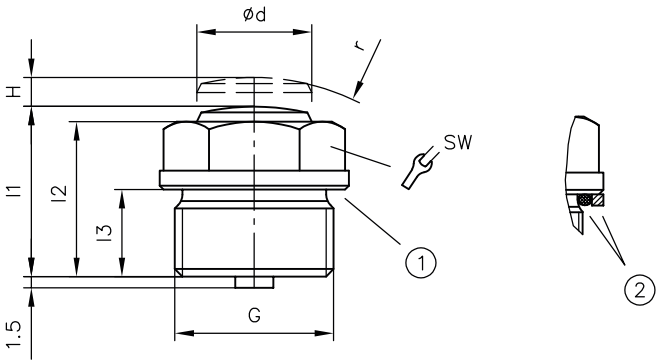
p pressure (bar); F force (N)

4 Dimensions

All dimensions in mm, subject to change.

4.1 Screw-in cylinder type HSE

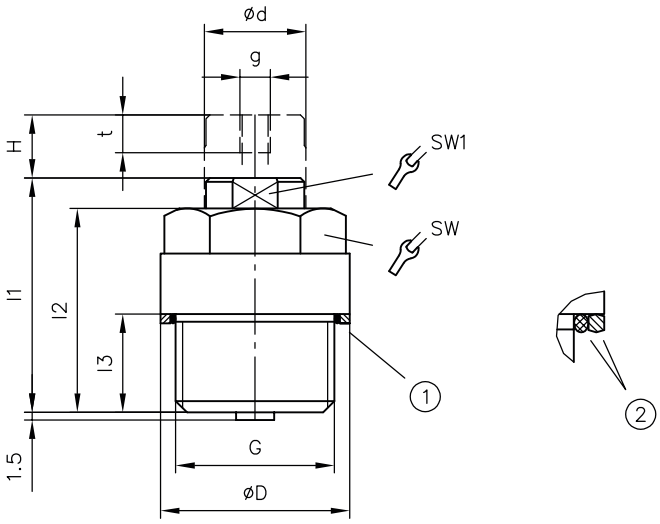
HSE 12-2, HSE 16-3
HSE 20-4, HSE 24-5



SW = Width across flats

1 Sealing edge
2 O-ring and steel supporting ring for HSE 24-5

HSE

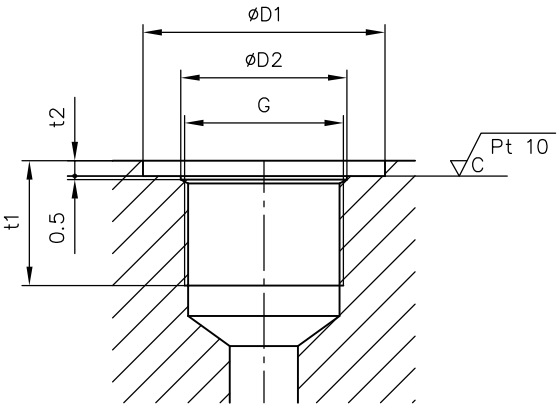


1 Sealing ring DIN 7603-Cu
2 O-ring and steel supporting ring for HSE 24-15 and HSE 24-20

Type	∅D	G	H	∅d	g	l1	l2	l3	r	t	SW	SW1	Tightening torque (Nm) *
HSE 12-2	No collar, hexagonal, continuous	M20x1.5	2	12	--	20.5	19	11	40	--	24	--	80
HSE 12-5			5		M5	28	22		--	4		9	
HSE 12-8			8			32.5	26.5						
HSE 16-3	28	M24x1.5	3	16	--	26.5	25	14	50	--	24	--	130
HSE 16-8			8		M6	35.5	29		--	6		12	
HSE 16-12			12			41.5	35						
HSE 20-4	35	M30x1.5	4	20	--	28.5	26.5	14.5	60	--	30	--	250
HSE 20-10			10		M6	44	37	16.5	--	6		17	
HSE 20-15			15			51	44						
HSE 20-20			20			56	49						
HSE 24-5	45	M36x1.5	5	24	--	34	32	19	70	--	36	--	500
HSE 24-15			15		M8	56	47	20	--	6		19	
HSE 24-20			20			65	55						

* approx. 2x protection against deformation or breakage

Mounting hole



Type	∅D1	∅D2	G	t1	t2
HSE 12-2	28	20.2	M20x1.5	12	0.2
HSE 12-5	$24^{+0.1}$				0.8
HSE 12-8					
HSE 16-3	$29^{+0.1}$	24.2	M24x1.5	--	0.2
HSE 16-8				15	2
HSE 16-12					
HSE 20-4	$36^{+0.1}$	30.2	M30x1.5	16	0.2
HSE 20-10				18	2
HSE 20-15					
HSE 20-20					
HSE 24-5	$46^{+0.1}$	36.2	M36x1.5	22	2
HSE 24-15				23	
HSE 24-20					

5 Installation, operation and maintenance information

Observe the document B 5488 “General operating instructions for assembly, commissioning, and maintenance.”

5.1 Intended use

This product is intended exclusively for hydraulic applications (fluid technology).

The user must observe the safety measures and warnings in this document.

Essential requirements for the product to function correctly and safely:

- ► All information in this documentation must be observed. This applies in particular to all safety measures and warnings.
- ► The product must only be assembled and put into operation by specialist personnel.
- ► The product must only be operated within the specified technical parameters described in detail in this document.
- ► All components must be suitable for the operating conditions when using an assembly.
- ► The operating instructions for the components, assemblies and the specific complete system must also always be observed.

If the product can no longer be operated safely:

1. Remove the product from operation and mark it accordingly.
   ✓ It is then not permitted to continue using or operating the product.

5.2 Assembly information

The product must only be installed in the complete system with standard and compliant connection components (screw fittings, hoses, pipes, fixtures etc.).

The product must be shut down correctly prior to disassembly (in particular in combination with hydraulic accumulators).

⚠ **DANGER**

Sudden movement of the hydraulic drives when disassembled incorrectly

Risk of serious injury or death

- ► Depressurise the hydraulic system.
- ► Perform safety measures in preparation for maintenance.

5.3 Operating instructions

Observe product configuration and pressure/flow rate.

The statements and technical parameters in this document must be strictly observed.
The instructions for the complete technical system must also always be followed.

NOTICE

- ► Read the documentation carefully before usage.
- ► The documentation must be accessible to the operating and maintenance staff at all times.
- ► Keep documentation up to date after every addition or update.

CAUTION

Overloading components due to incorrect pressure settings.
Risk of minor injury. Parts may burst or fly off, and uncontrolled leakage of hydraulic fluid.

- Pay attention to the maximum operating pressure of the pump, valves and fittings.
- Always monitor the pressure gauge when setting and changing the pressure.

Purity and filtering of the hydraulic fluid

Fine contamination can significantly impair the function of the product. Contamination can cause irreparable damage.

Examples of fine contamination include:

- Swarf
- Rubber particles from hoses and seals
- Dirt due to assembly and maintenance
- Mechanical debris
- Chemical ageing of the hydraulic fluid

NOTICE

New hydraulic fluid from the manufacturer may not have the required purity.
Damage to the product is possible.

- ► Filter new hydraulic fluid to a high quality when filling.
- ► Do not mix hydraulic fluids. Always use hydraulic fluid that is from the same manufacturer, of the same type, and with the same viscosity properties.

For smooth operation, pay attention to the cleanliness level of the hydraulic fluid (cleanliness level see Chapter 3, "Parameters").

Additionally applicable document: D 5488/1 oil recommendations

5.4 Maintenance information

Check regularly (at least once a year) by visual inspection whether the hydraulic connections are damaged. If external leakages are found, shut down and repair the system.

Clean the surface of the device regularly (at least once a year) (dust deposits and dirt).

6 Other information

6.1 Piston load

- Lateral forces on the piston must always be avoided.
- When the piston is retracted, additional external forces acting on it in the axial direction must be absorbed by an external stop.

6.2 Delayed piston retraction movement

INFORMATION

Depending on the viscosity of the hydraulic fluid, the flow resistance will change and may delay the retraction movement of the piston.

- ► Avoid long and/or narrow hydraulic lines, or
- ► Fit additional return springs on the outside