

SOLENOID
OPERATED VALVES



CONTINUOUS
DUTY COIL

CONNECTORS





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CONNECTORS



The company



Since 1967 HBS Group operates in the production and marketing of hydraulic and electromechanical components. The constant search for technical solutions, the constant improving the quality of product and process, in addition to the efficiency and flexibility of the production allow **HBS** to the continued success in the global market. The presence of **HBS** with unit production and trade in different continents, alongside a qualified distribution network, provides customer assistance it needs. **HBS** is your partner for the development and supply of hydraulic components and electromechanical.

With its technical staff **HBS** is able to realize and customize, in synergy with the customer, highly innovative solenoid operated valves for each type of use, from transport to construction, from construction machinery to agriculture, from ecology to industrial systems.



PHILOSOPHY



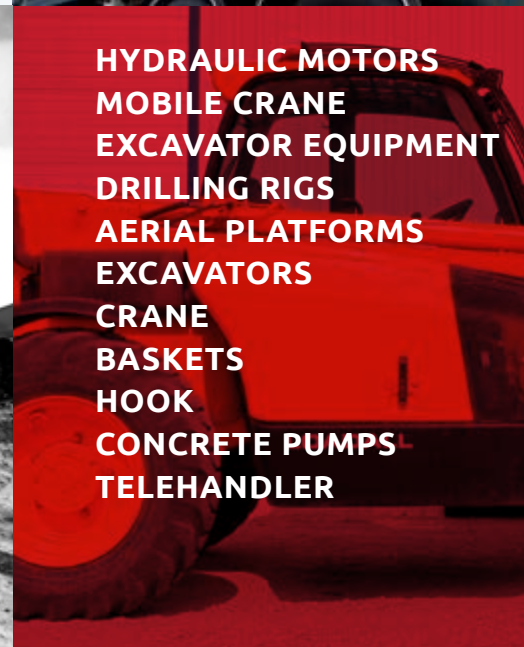
HBS bases its development on the singergy with the customer

R&D

HBS is able to anticipate the needs of the changing market and to develop customized products



Application fields



INNOVATION

HBS is one truth in a position to forerunning the needs of a market in constant evolution



- HYDRAULIC MOTORS
- MOBILE CRANE
- EXCAVATOR EQUIPMENT
- DRILLING RIGS
- AERIAL PLATFORMS
- EXCAVATORS
- CRANE
- BASKETS
- HOOK
- CONCRETE PUMPS
- TELEHANDLER

To choose technology HBS, mean to entrust themselves to a sure, synonymous partner of quality in the lift.

For this we put to disposition know how of our engineers and our technicians who place side by side the customers in the planning, in the study and the search of new solutions. Thanks to the high level of experience acquired by its personnel, **HBS** personalised design and planning, and high level professional consulting for the installation of systems are guaranteed.

With the unit planning, **HBS** in a position to devising, realizing and to personalize, in synergy with the customer, valves and hydraulic components highly innovated for every kind of employment, from the transports to the earth movement, from the building to agriculture, the ecology to the industrial systems. **HBS** bases the principle of its own development upon synergism with the costumer.



Introduction

PRODUCTION RANGE

The HBS S.p.a production range includes different types and styles of valves, manufactured to be considered as standard items, therefore they cannot be considered as partial machines or safety components and for this reason they are excluded from the domain of the EEC European Directive 2006/46/CE.

The HBS valves cannot be used on the machine until the complete machine has been verified to be compliant with the requirements of the EEC EUROPEAN DIRECTIVE 2006/46/CE.

CARTRIDGE VALVES

This valves must at all times be installed into specified cavities as shown in the HBS catalogue. The valves can be mounted directly into the actuator body or external inline bodies. The internal components of the valves are made in hardened steel. Please refer to the assembly torques figures shown in this catalogue to secure the valves into the cavities in the manifolds. In case the cartridges are not being used in steel or aluminium manifolds, or with different external coating from the treatment used by HBS, please contact our technical department for the relevant new torque values. To ensure the correct performances of the cartridge valves, cavities must correspond to the catalogue's indications and be absolutely cleaned to ensure that there are no markings or burs left on the surfaces before fitting the valves. Lubricate the cartridge seals before assembling, insert the cartridge manually and screw it until the operator feels the seals resistance.

Lock the cartridge with a torque wrench and set the valve on the test rig. After final testing please check again the torque setting.

INTEGRAL VALVES WITHIN MANIFOLDS OR BODIES

They basically consist of a steel body with a cartridge. The valve housing is normally manufactured in steel or upon request from an aluminium extruded bar. Steel bodies are available with external anticorrosion protection treatment with zinc coating. Aluminium bodies are only suitable to be used in applications where the max pressure is rarely reached or with low working frequency (max 60 cycles per day). On request the manifolds can be supplied with black anodizing treatment. Other colours available on request. In general the valves in manifolds have the ports for the connection into the hydraulic circuit. The ports are normally BSPP types. Other ports are available upon request such as valves which are also available in flangeable version with SAE 3000 or SAE 6000 ports. All types of valves, cartridges or in bodies, are fitted with NBR or Buna-N seals, suitable for working with temperatures between -20°C and +90°C. Viton seals are available on request. Should the valves be used above the temperature range indicated, please contact our technical department. The mounting position for the valves is unrestricted.

FLUIDS - FILTERING - LEAKAGE

HBS valves are designed to work with Mineral Oil for all standard hydraulic equipments such as pumps, motors,

cylinders. In order for the correct function of the valves it is essential that the filtration of the oil is kept to the levels of

filtration stated between NAS 8 and 11. (see chart). HBS recommends these max contamination levels as follows:

Valve - Application	ISO 4406	NAS
Valves used with pressure over 250 bar, with internal pilot connections, or with continuous duty	17/14	8
Valves for intermitted cycles or pressure up to 250 bar	18/14	9
Valves to be used below 100 bar	19/16	11

HBS valves have metallic seats without seals. They can produce a very low oil leakage path across the seats. Some of them can show a maximum leakage of 5 drops per minute (1 cm³ = 20 drops) without any fault in their performances.

SETTINGS

The setting values in the catalogue are referred to as using and hydraulic oil with a viscosity of 16 Centistokes at flow rate of 5l/min. HBS test rigs have a minimum filtration level of NAS 8.

STORAGE

Valves should be kept only in rooms with temperature ranges between -5°C and +45°C. Protect the valves from the direct sun light and from sources of ozone atmosphere and do not remove the original plastic wrapping to avoid entrance of contamination and to keep the internal components oiled and protected.

PERFORMANCE CURVES

The curves illustrated in the catalogue pages are referred to the test made by HBS. However small differences in practice do not affect the performances and reliability of the valves. The curves available for every valve are obtained utilizing mineral oil with viscosity of 16 cSt, 50°C of temperature, and 20°C of ambient temperature. It is Customer's responsibility to test an appropriate number of samples to prove the correct function of the valves. The working condition of the Customer's machines cannot be completely simulated during our approval tests on our in-house test rigs. HBS confirms that all its products are individually tested during the production and controlled according to the internal quality procedure. Valves have to be used for the application and in respect of the technical specification shown in the catalogue.



Index

Solenoid Operated Valves

01

Continuous Duty Coil

02

Connectors

03

Accessories and manual exclusions

04

Cavities - Tooling

05

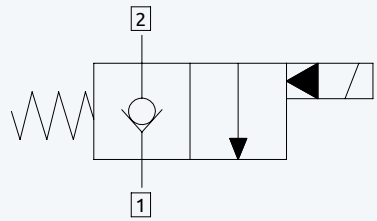
Standards Manifold

06

01 Solenoid operated valves

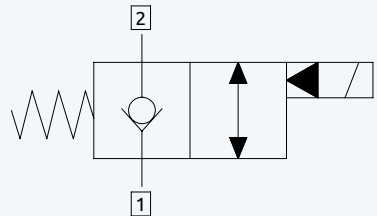
NORMALLY CLOSED

No reverse flow energized



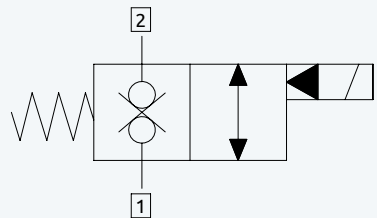
Code	l/min	Bar	Cavity	Pag. catalogue
E121080000	40	350	SAE 08	01.01.01
E121081000	40	350	SAE 08	01.01.01
E121100000	70	350	SAE 10	01.01.02
E121101000	70	350	SAE 10	01.01.02
E121120000	150	350	SAE 12	01.01.03
E121121000	150	350	SAE 12	01.01.03
E121160000	150	350	SAE 16	01.01.04
E121161000	150	350	SAE 16	01.01.04

Reverse flow energized



E122080000	40	350	SAE 08	01.02.01
E122081000	40	350	SAE 08	01.02.01
E122100000	70	350	SAE 10	01.02.02
E122101000	70	350	SAE 10	01.02.02
E122120000	150	350	SAE 12	01.02.03
E122121000	150	350	SAE 12	01.02.03
E122160000	150	350	SAE 16	01.02.04
E122161000	150	350	SAE 16	01.02.04

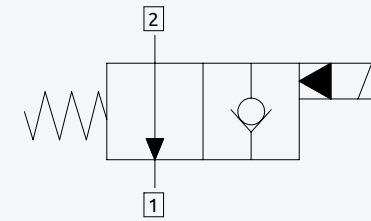
Double Lock



E123080000	40	350	SAE 08	01.03.01
E123081000	40	350	SAE 08	01.03.01
E123100000	70	350	SAE 10	01.03.02
E123101000	70	350	SAE 10	01.03.02
E123120000	150	350	SAE 12	01.03.03
E123121000	150	350	SAE 12	01.03.03
E123160000	150	350	SAE 16	01.03.04
E123161000	150	350	SAE 16	01.03.04

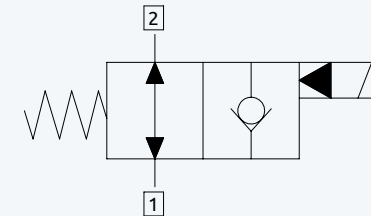
NORMALLY OPEN

No reverse flow de-energized



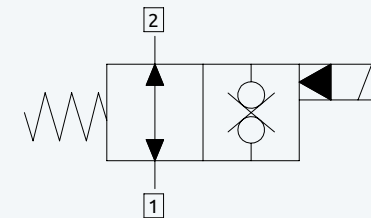
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E221080000	40	350	SAE 08	01.04.01
E221082000	40	350	SAE 08	01.04.01
E221083000	40	350	SAE 08	01.04.01
E221100000	70	350	SAE 10	01.04.02
E221102000	70	350	SAE 10	01.04.02
E221103000	70	350	SAE 10	01.04.02
E221120000	150	350	SAE 12	01.04.03
E221122000	150	350	SAE 12	01.04.03
E221123000	150	350	SAE 12	01.04.03
E221160000	150	350	SAE 16	01.04.04
E221162000	150	350	SAE 16	01.04.04
E221163000	150	350	SAE 16	01.04.04

Reverse flow de-energized



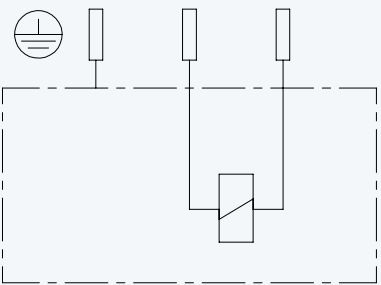
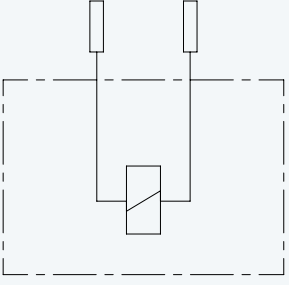
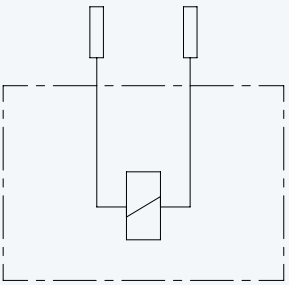
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E222082000	40	350	SAE 08	01.05.01
E222083000	40	350	SAE 08	01.05.01
E222100000	70	350	SAE 10	01.05.02
E222102000	70	350	SAE 10	01.05.02
E222103000	70	350	SAE 10	01.05.02
E222120000	150	350	SAE 12	01.05.03
E222122000	150	350	SAE 12	01.05.03
E222123000	150	350	SAE 12	01.05.03
E222160000	150	350	SAE 16	01.05.04
E222162000	150	350	SAE 16	01.05.04
E222163000	150	350	SAE 16	01.05.04

Double Lock

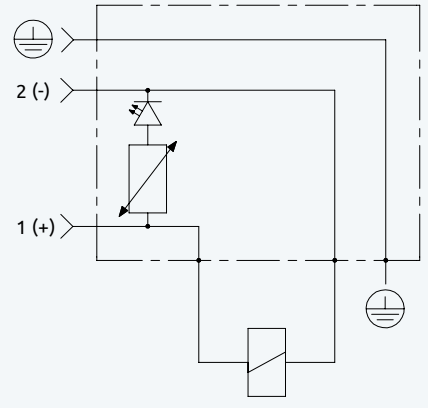
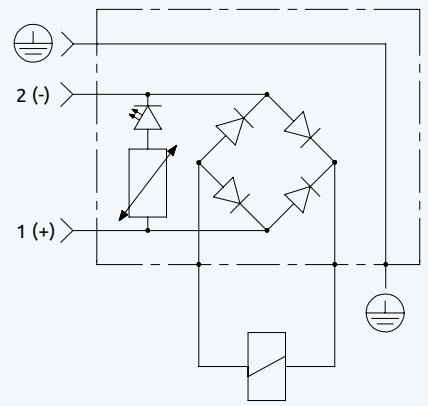


E223080000	40	350	SAE 08	01.06.01
E223082000	40	350	SAE 08	01.06.01
E223083000	40	350	SAE 08	01.06.01
E223100000	70	350	SAE 10	01.06.02
E223102000	70	350	SAE 10	01.06.02
E223103000	70	350	SAE 10	01.06.02
E223120000	150	350	SAE 12	01.06.03
E223122000	150	350	SAE 12	01.06.03
E223123000	150	350	SAE 12	01.06.03
E223160000	150	350	SAE 16	01.06.04
E223162000	150	350	SAE 16	01.06.04
E223163000	150	350	SAE 16	01.06.04

02 Continuous duty coil

Connector DIN43650-ISO4400	Code	Tension	Bore size (mm)	Pag. catalogue
	EB1101220100	12 V-DC	12.7	02.01.01
	EB1102420100	24 V-DC	12.7	02.01.01
	EB1102620100	26 V-DC	12.7	02.01.01
	EB1102820100	28 V-DC	12.7	02.01.01
	EB1103620100	36 V-DC	12.7	02.01.01
	EB1202420100	24 V-RAC	12.7	02.01.01
	EB1211020100	110 V-RAC	12.7	02.01.01
	EB1222020100	220 V-RAC	12.7	02.01.01
Connector AMP JUNIOR				
	EB1101020200	10 V-DC	12.7	02.02.01
	EB1101220200	12 V-DC	12.7	02.02.01
	EB1102020200	20 V-DC	12.7	02.02.01
	EB1102420200	24 V-DC	12.7	02.02.01
	EB1102620200	26 V-DC	12.7	02.02.01
	EB1102820200	28 V-DC	12.7	02.02.01
	EB1103620200	36 V-DC	12.7	02.02.01
	EB1104820200	48 V-DC	12.7	02.02.01
Connector DEUTSCH DT04-2P				
	EB1101020300	10 V-DC	12.7	02.03.01
	EB1101220300	12 V-DC	12.7	02.03.01
	EB1102020300	20 V-DC	12.7	02.03.01
	EB1102420300	24 V-DC	12.7	02.03.01
	EB1102620300	26 V-DC	12.7	02.03.01
	EB1102820300	28 V-DC	12.7	02.03.01
	EB1103620300	36 V-DC	12.7	02.03.01
	EB1104820300	48 V-DC	12.7	02.03.01

03 Connector

	Code	Current	Connector	Pag. catalogue
	EC01101100	DC	DIN43650	03.01.01
	EC01202100	RAC	DIN43650	03.02.01
	EC01203100	RAC	DIN43650	03.02.01

04 Accessories and manual exclusions

Code	Pag. catalogue
EA1000	04.01.01
EA2000	04.01.01
EA3000	04.01.01
EA4000	04.01.01

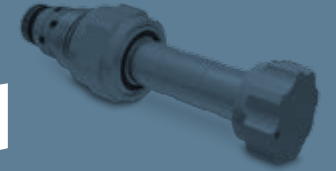
05 Cavities - Tooling

Code	Pag. catalogue
SAE 08	05.01.01
SAE 10	05.01.01
SAE 12	05.01.02
SAE 16	05.01.02

06 Standards manifold

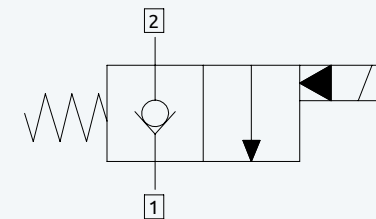
Code	Cavity	Pag. catalogue
EM-202080000	SAE 08	06.01.01
EM-203080000	SAE 08	06.01.01
EM-291080000	SAE 08	06.01.01
EM-292080000	SAE 08	06.01.01
EM-203100000	SAE 10	06.01.01
EM-204100000	SAE 10	06.01.01
EM-206100000	SAE 10	06.01.01
EM-292100000	SAE 10	06.01.01
EM-293100000	SAE 10	06.01.01
EM-294100000	SAE 10	06.01.01
EM-204120000	SAE 12	06.01.01
EM-206120000	SAE 12	06.01.01
EM-206160000	SAE 16	06.01.01
EM-208160000	SAE 16	06.01.01
EM-296160000	SAE 16	06.01.01

Solenoid operated valve normally closed



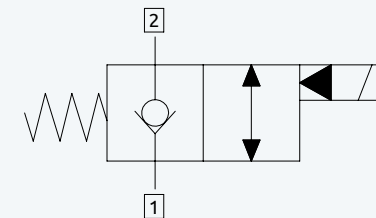
NO REVERSE FLOW ENERGIZED

NC (normally closed) valve, with de-energized coil, works as a check valve locking oil flow from 2 to 1 and allowing free flow from 1 to 2. Energizing the coil the poppet opens the 2 to 1 flow path. They are normally used in high pressure circuits as check valves or to ensure the static lock of a load.



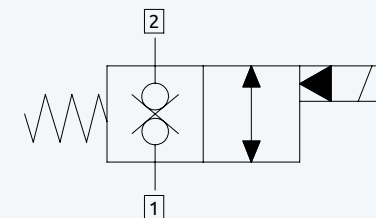
REVERSE FLOW ENERGIZED

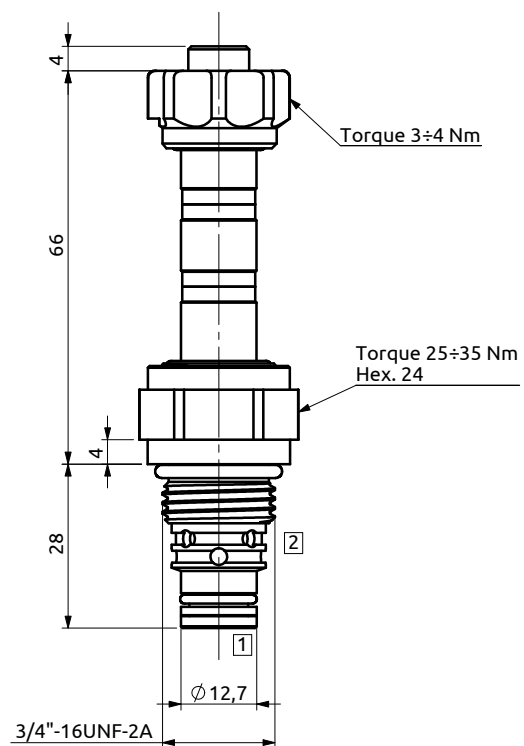
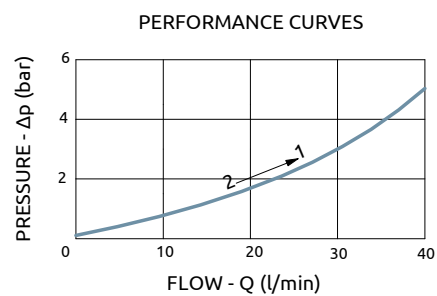
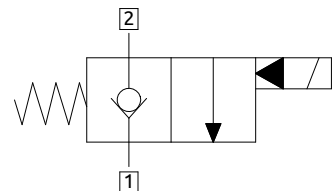
NC (normally closed) valve, with de-energized coil, works as a check valve locking oil flow from 2 to 1 and allowing free flow from 1 to 2. Energizing the coil the poppet opens the flow path in both ways. They are normally used in high pressure circuits as check valves or to ensure the static lock of a load.



DOUBLE LOCK

NC (normally closed) valve, with de-energized coil, works as a check valve locking oil flow from 2 to 1 and from 1 to 2. Energizing the coil the poppet opens the flow path in both ways. They are normally used in high pressure circuits as check valves or to ensure the static lock of a load.



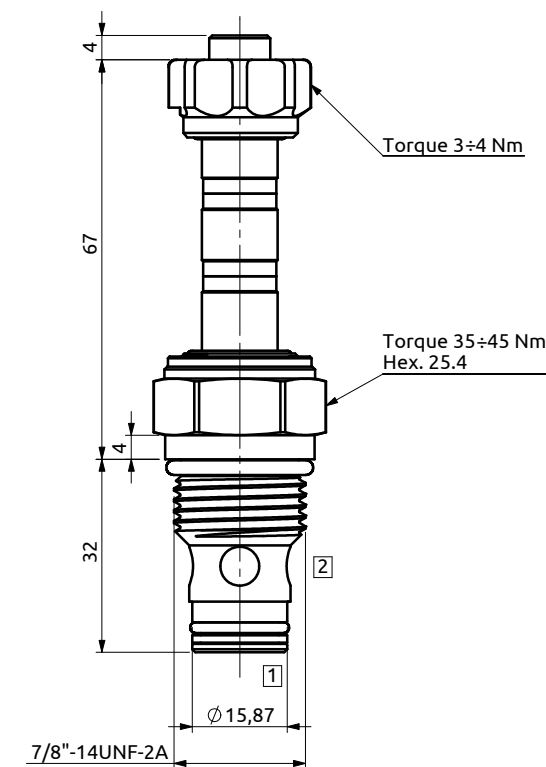
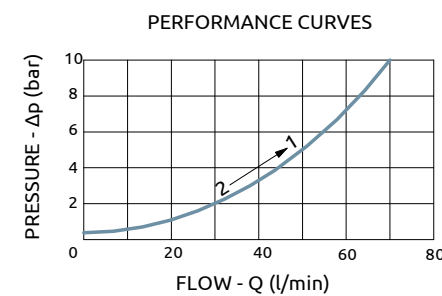
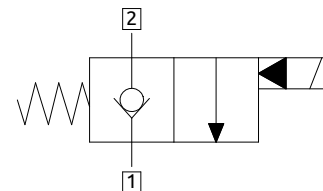


	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E121080000
2	Manual screw	E121081000

PRESSURE	350 bar
FLOW	40 l/min
CAVITY	SAE 08
SEALS	NBR

INTERNAL LEAKAGE	0.15 cc/min
OIL TEMPERATURE	-40 ÷ 120 °C
FILTRATION	25 µm or better
WEIGHT	0.13 kg

Continuous duty coil must be ordered separately, see section 02

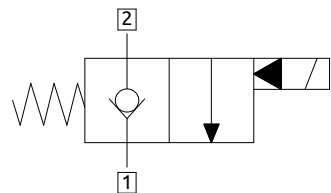


	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E121100000
2	Manual screw	E121101000

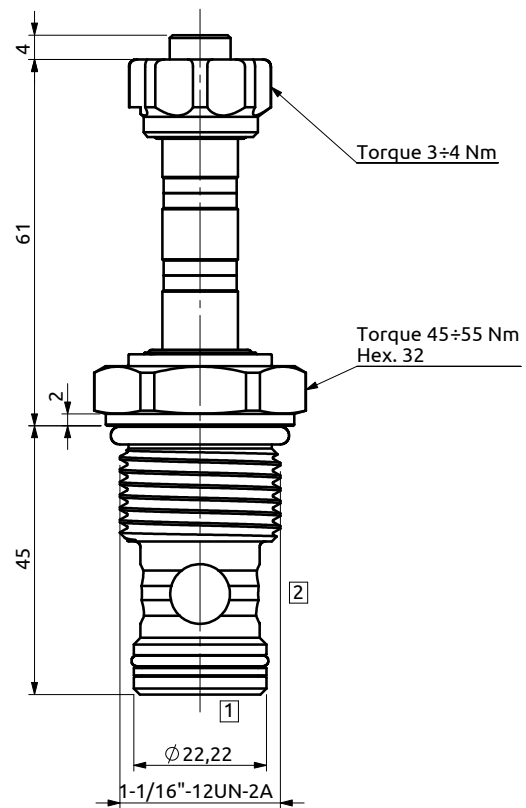
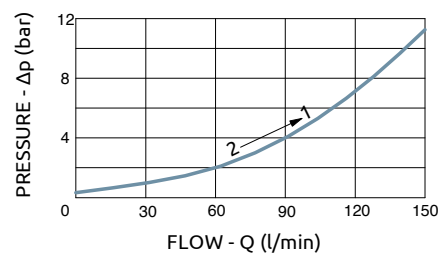
PRESSURE	350 bar
FLOW	70 l/min
CAVITY	SAE 10
SEALS	NBR

INTERNAL LEAKAGE	0.15 cc/min
OIL TEMPERATURE	-40 ÷ 120 °C
FILTRATION	25 µm or better
WEIGHT	0.16 kg

Continuous duty coil must be ordered separately, see section 02



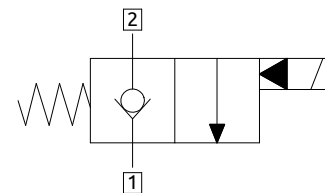
PERFORMANCE CURVES



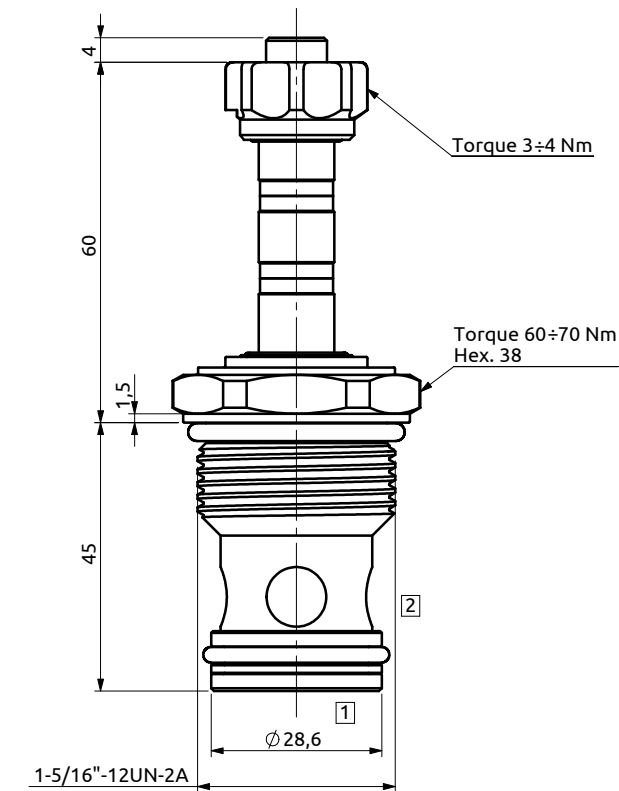
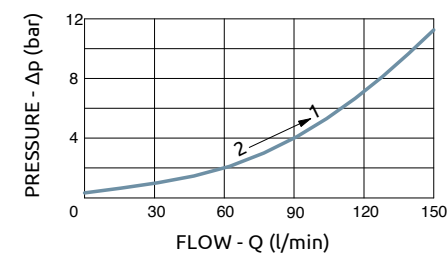
	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E121120000
2	Manual screw	E121121000

PRESSURE	350 bar	INTERNAL LEAKAGE	0.15 cc/min
FLOW	150 l/min	OIL TEMPERATURE	-40 ÷ 120 °C
CAVITY	SAE 12	FILTRATION	25 µm or better
SEALS	NBR	WEIGHT	0.23 kg

Continuous duty coil must be ordered separately, see section 02



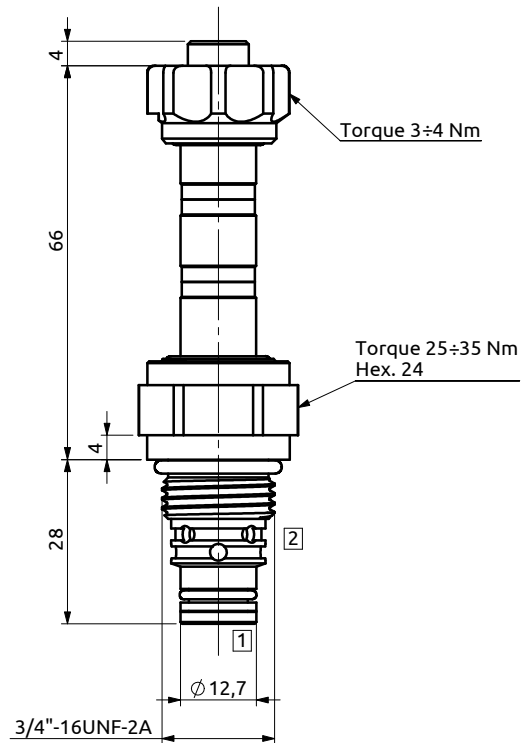
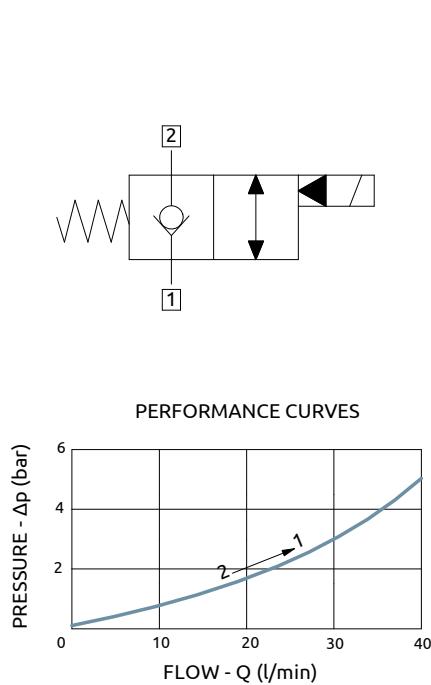
PERFORMANCE CURVES



	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E121160000
2	Manual screw	E121161000

PRESSURE	350 bar	INTERNAL LEAKAGE	0.15 cc/min
FLOW	150 l/min	OIL TEMPERATURE	-40 ÷ 120 °C
CAVITY	SAE 16	FILTRATION	25 µm or better
SEALS	NBR	WEIGHT	0.35 kg

Continuous duty coil must be ordered separately, see section 02

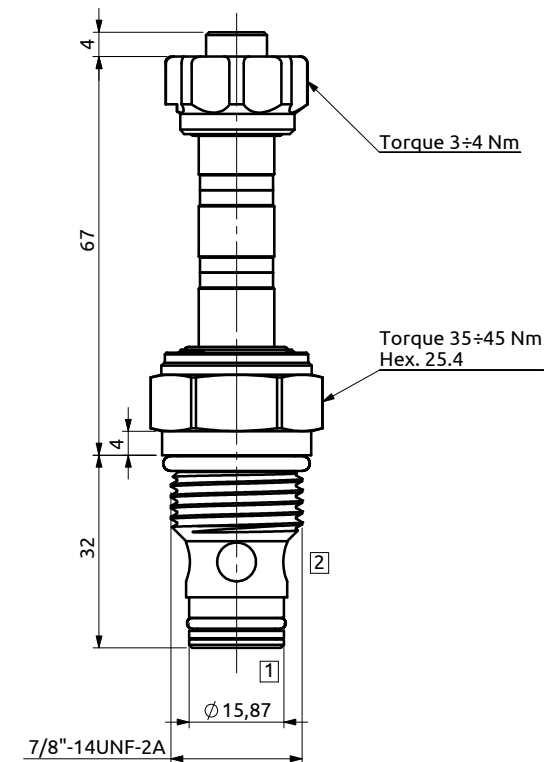
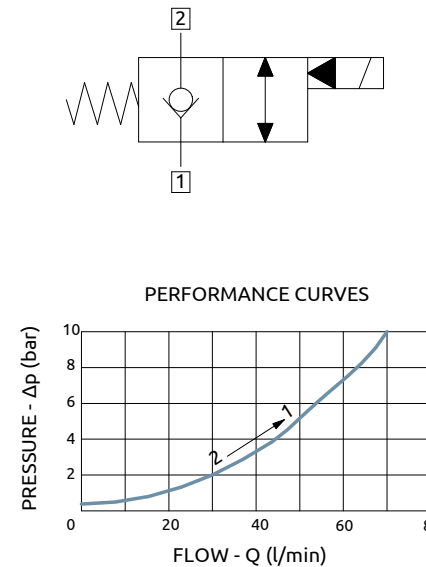


	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E122080000
2	Manual screw	E122081000

PRESSURE	350 bar
FLOW	40 l/min
CAVITY	SAE 08
SEALS	NBR

INTERNAL LEAKAGE	0.15 cc/min
OIL TEMPERATURE	-40 ÷ 120 °C
FILTRATION	25 µm or better
WEIGHT	0.13 kg

Continuous duty coil must be ordered separately, see section 02

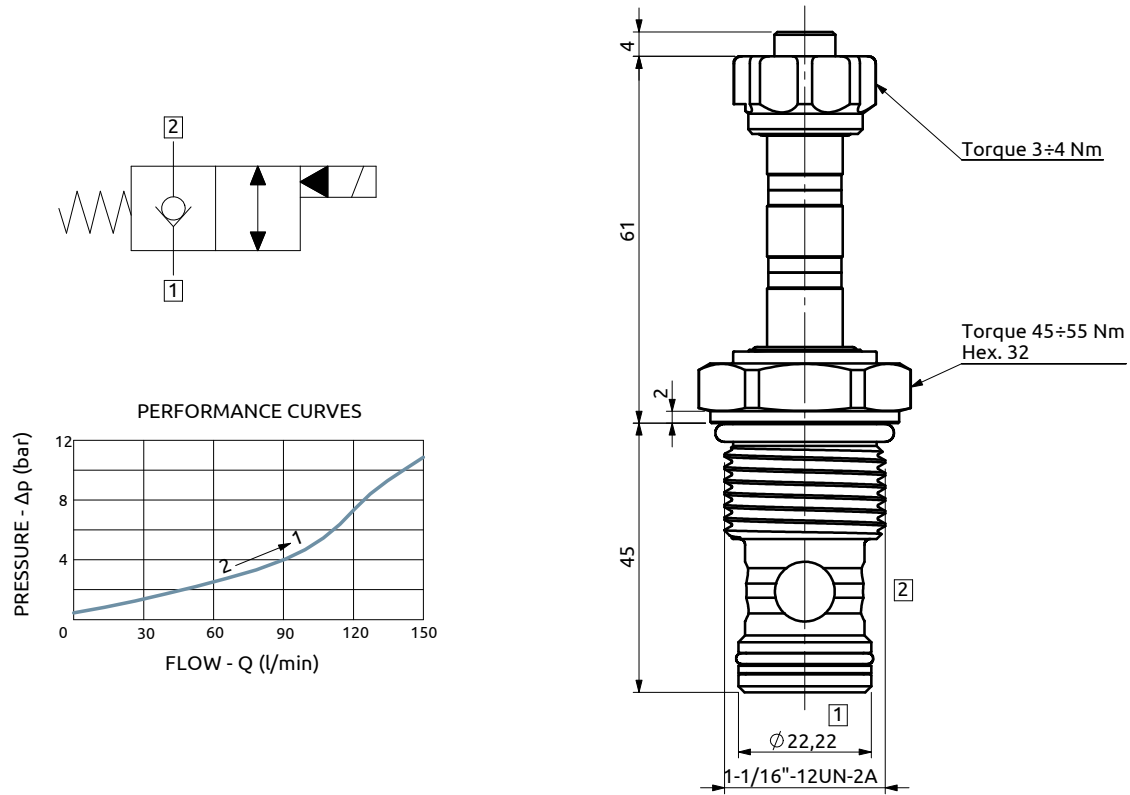


	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E122100000
2	Manual screw	E122101000

PRESSURE	350 bar
FLOW	70 l/min
CAVITY	SAE 10
SEALS	NBR

INTERNAL LEAKAGE	0.15 cc/min
OIL TEMPERATURE	-40 ÷ 120 °C
FILTRATION	25 µm or better
WEIGHT	0.16 kg

Continuous duty coil must be ordered separately, see section 02

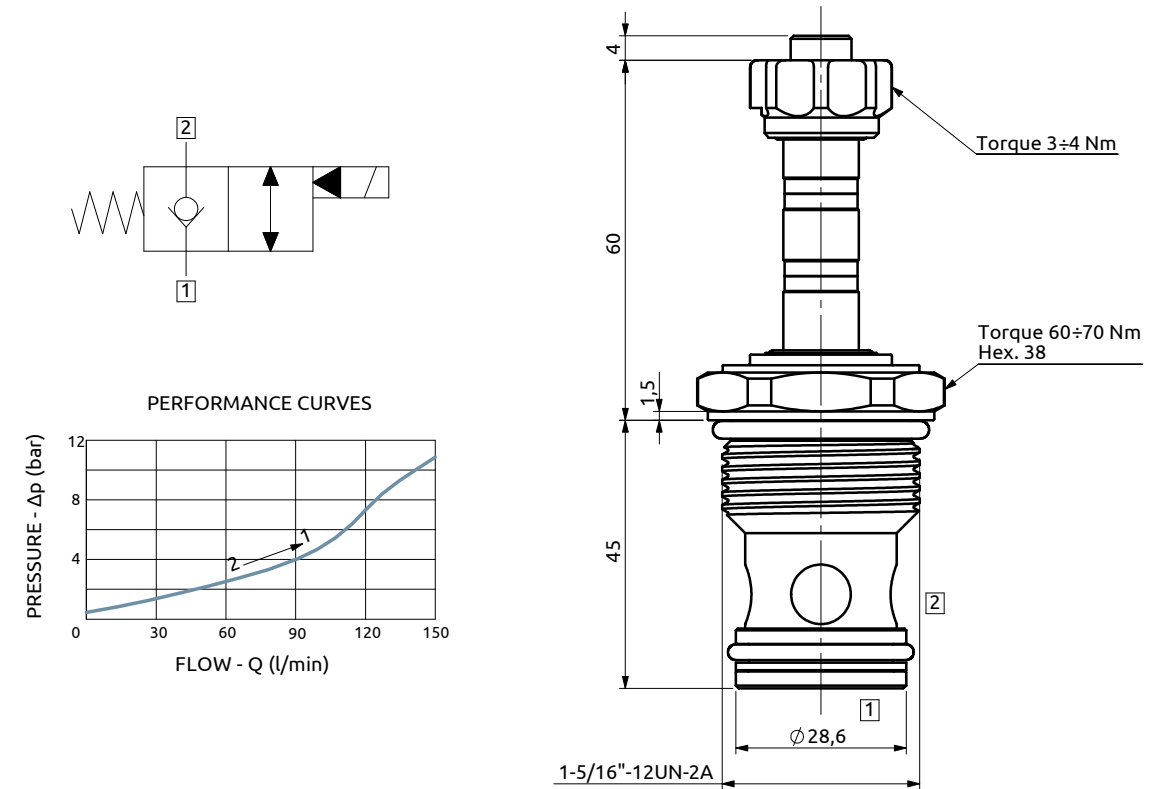


	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E122120000
2	Manual screw	E122121000

PRESSURE	350 bar
FLOW	150 l/min
CAVITY	SAE 12
SEALS	NBR

INTERNAL LEAKAGE	0.15 cc/min
OIL TEMPERATURE	-40 ÷ 120 °C
FILTRATION	25 μm or better
WEIGHT	0.23 kg

Continuous duty coil must be ordered separately, see section 02

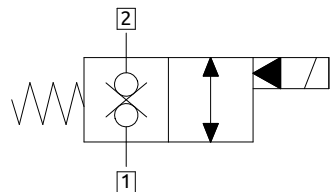


	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E122160000
2	Manual screw	E122161000

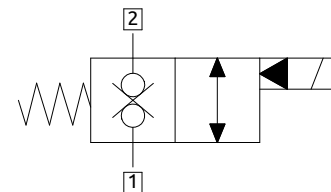
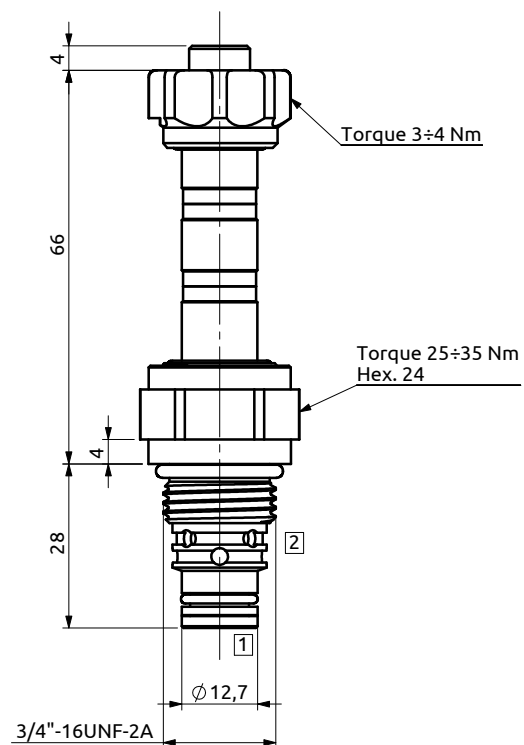
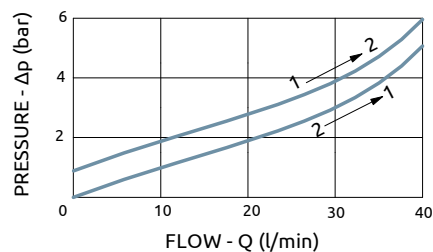
PRESSURE	350 bar
FLOW	150 l/min
CAVITY	SAE 16
SEALS	NBR

INTERNAL LEAKAGE	0.15 cc/min
OIL TEMPERATURE	-40 ÷ 120 °C
FILTRATION	25 μm or better
WEIGHT	0.35 kg

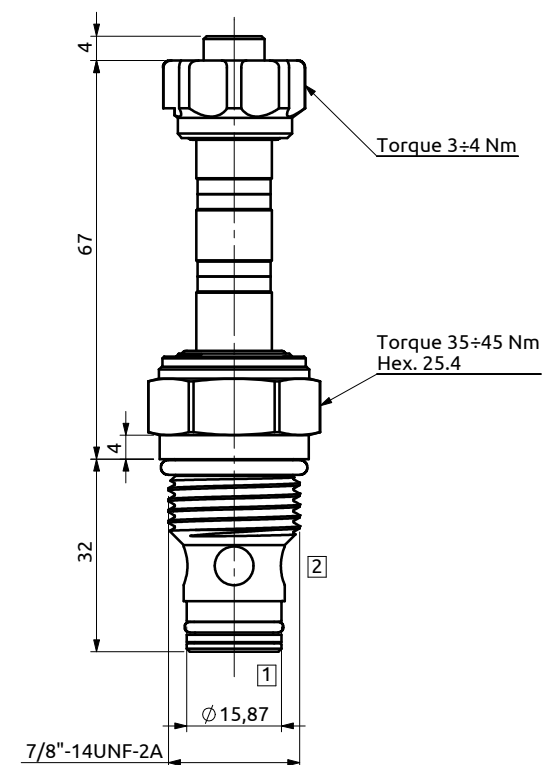
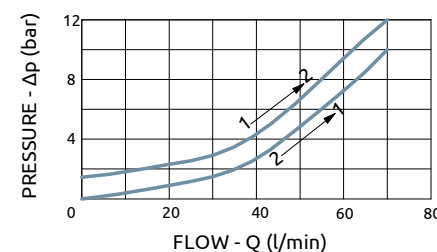
Continuous duty coil must be ordered separately, see section 02



PERFORMANCE CURVES



PERFORMANCE CURVES



	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E123080000
2	Manual screw	E123081000

PRESSURE	350 bar
FLOW	40 l/min
CAVITY	SAE 08
SEALS	NBR

INTERNAL LEAKAGE	0.15 cc/min
OIL TEMPERATURE	-40 ÷ 120 °C
FILTRATION	25 µm or better
WEIGHT	0.13 kg

Continuous duty coil must be ordered separately, see section 02

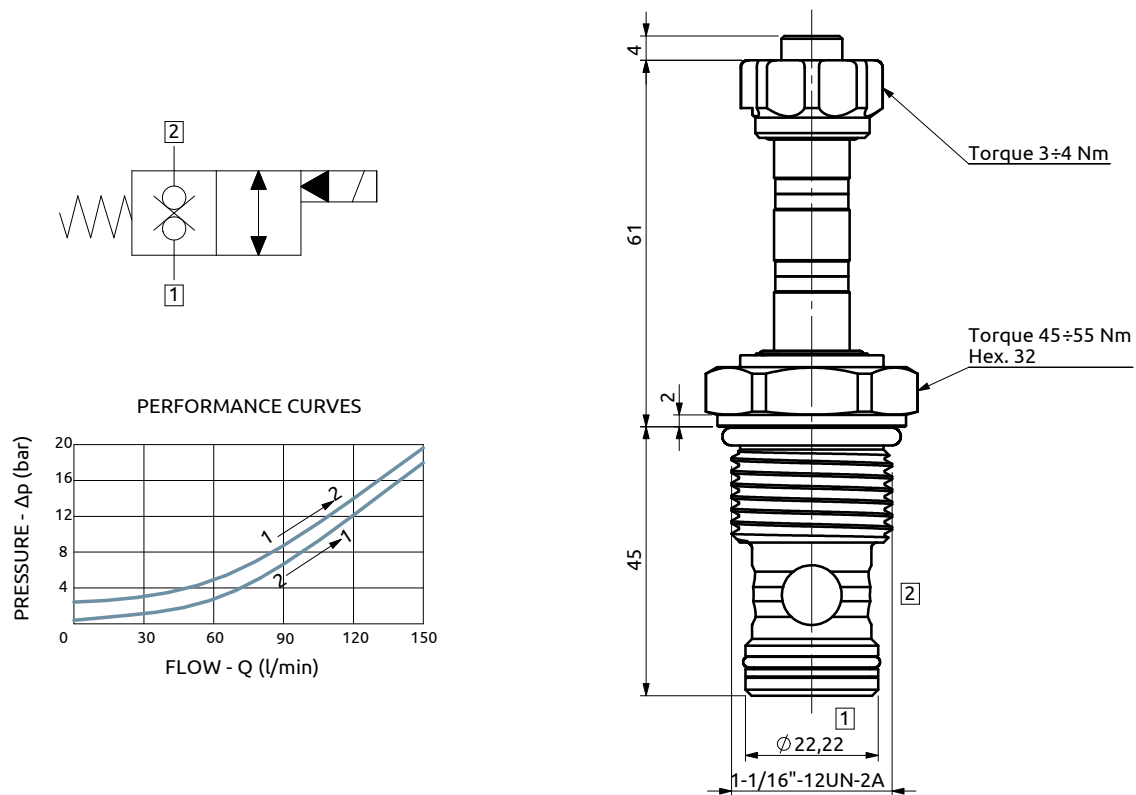


	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E123100000
2	Manual screw	E123101000

PRESSURE	350 bar
FLOW	70 l/min
CAVITY	SAE 10
SEALS	NBR

INTERNAL LEAKAGE	0.15 cc/min
OIL TEMPERATURE	-40 ÷ 120 °C
FILTRATION	25 µm or better
WEIGHT	0.16 kg

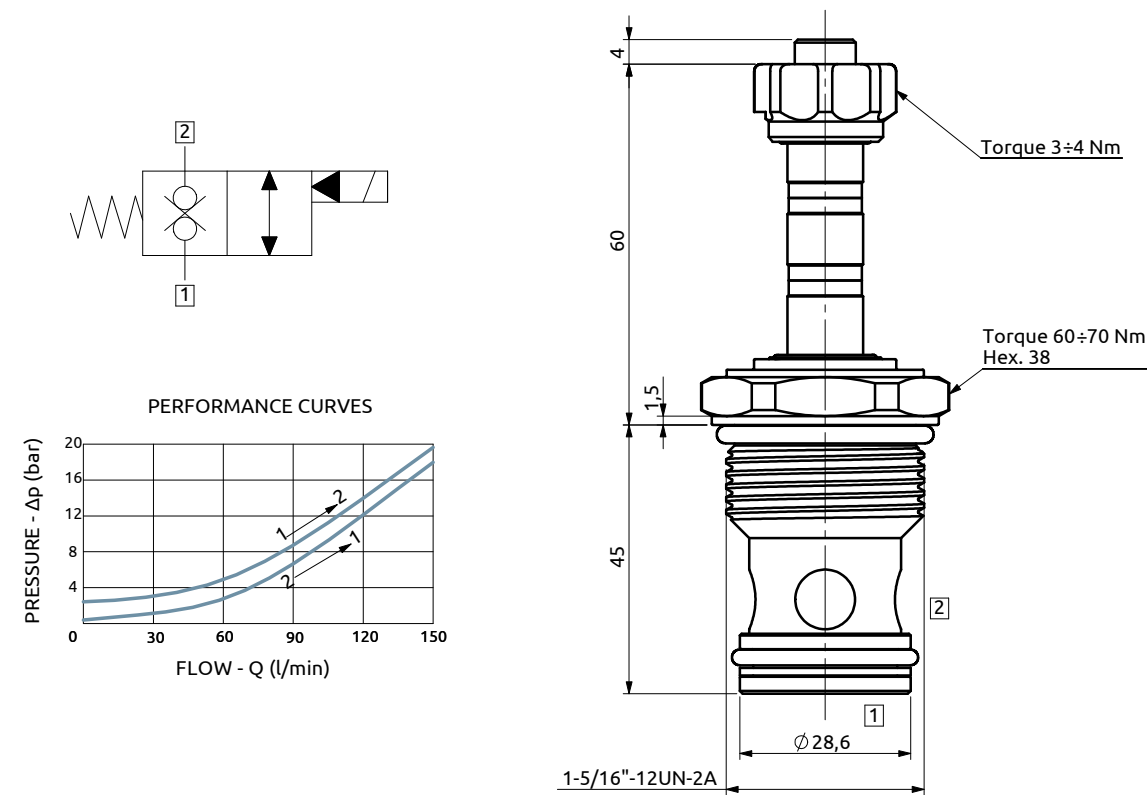
Continuous duty coil must be ordered separately, see section 02



	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E123120000
2	Manual screw	E123121000

PRESSURE	350 bar	INTERNAL LEAKAGE	0.15 cc/min
FLOW	150 l/min	OIL TEMPERATURE	-40 ÷ 120 °C
CAVITY	SAE 12	FILTRATION	25 µm or better
SEALS	NBR	WEIGHT	0.23 kg

Continuous duty coil must be ordered separately, see section 02



	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E123160000
2	Manual screw	E123161000

PRESSURE	350 bar	INTERNAL LEAKAGE	0.15 cc/min
FLOW	150 l/min	OIL TEMPERATURE	-40 ÷ 120 °C
CAVITY	SAE 16	FILTRATION	25 µm or better
SEALS	NBR	WEIGHT	0.35 kg

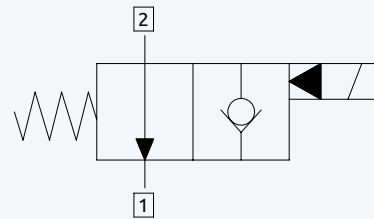
Continuous duty coil must be ordered separately, see section 02

Solenoid operated valve normally open



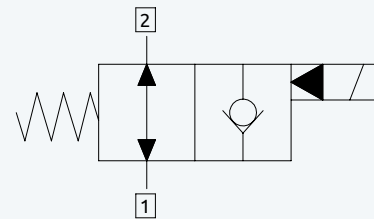
NO REVERSE FLOW DE-ENERGIZED

NA (normally open) valve, with de-energized coil, allows free oil flow from 2 to 1. Energizing the coil the poppet closes the 2 to 1 path interrupting the oil flow and allowing flow only from 1 to 2, the valve works as a check valve. They are normally used in high pressure circuits as check valves or to ensure the static lock of a load.



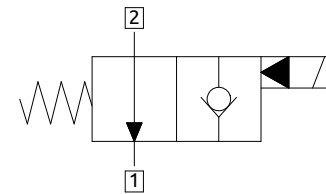
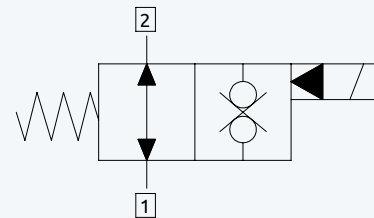
REVERSE FLOW DE-ENERGIZED

NA (normally open) valve, with de-energized coil, allows free oil flow from 2 to 1 and viceversa. Energizing the coil the poppet closes the 2 to 1 path interrupting the oil flow and allowing flow only from 1 to 2, the valve works as a check valve. They are normally used in high pressure circuits as check valves or to ensure the static lock of a load.

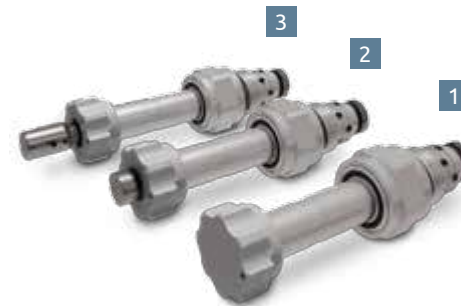
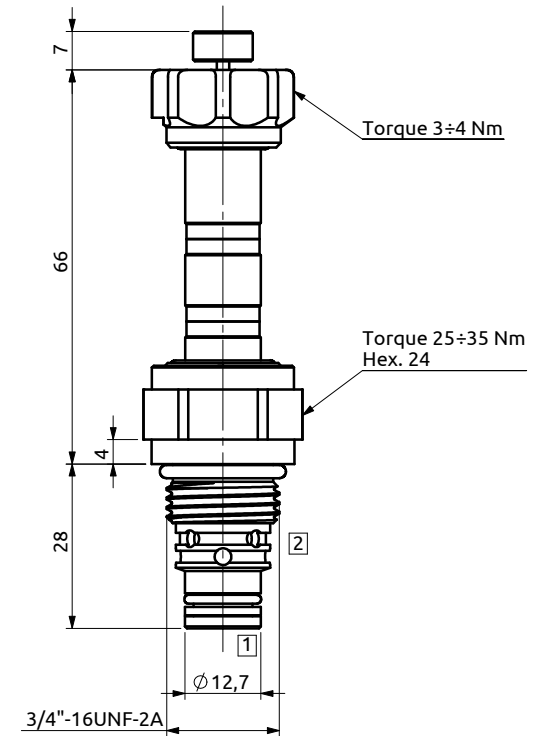
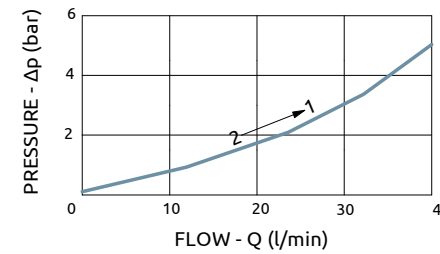


DOUBLE LOCK

NA (normally open) valve, with de-energized coil, allows free oil flow from 2 to 1 and viceversa. Energizing the coil the poppet closes the path interrupting the oil flow in both ways, the valve works as a check valve. They are normally used in high pressure circuits as check valves or to ensure the static lock of a load.



PERFORMANCE CURVES

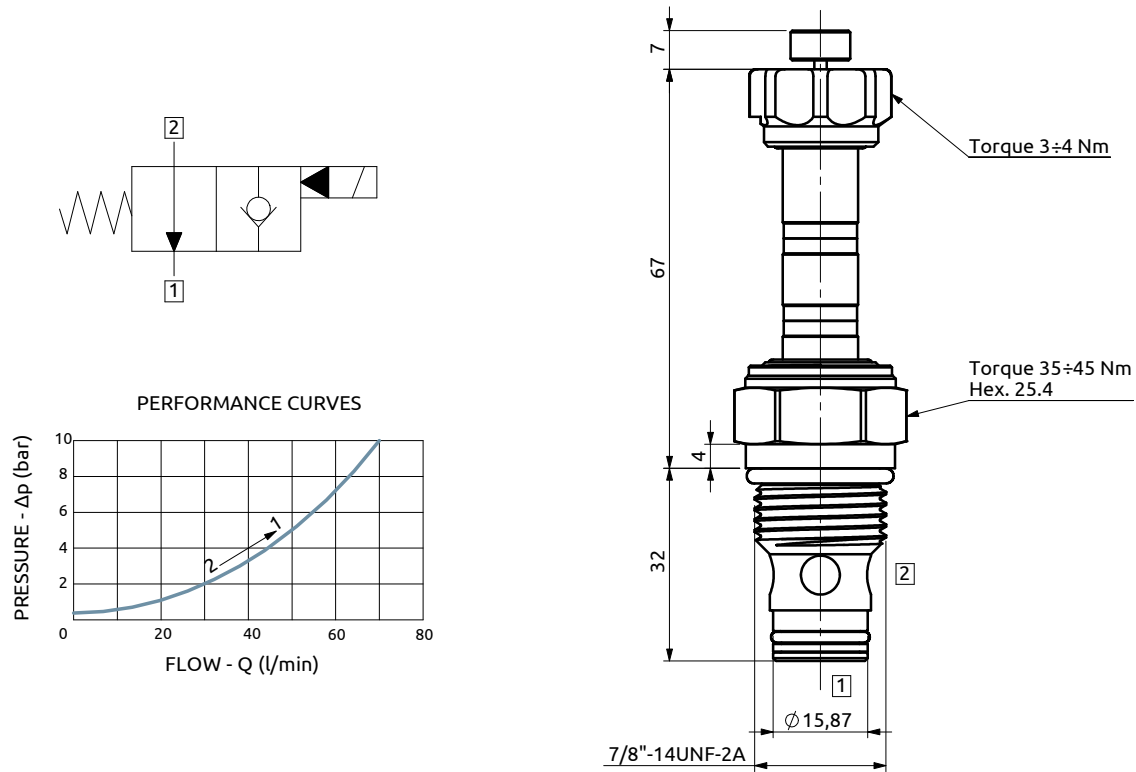


	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E221080000
2	Push button	E221082000
3	Push&twist button	E221083000

PRESSURE	350 bar
FLOW	40 l/min
CAVITY	SAE 08
SEALS	NBR

INTERNAL LEAKAGE	0.15 cc/min
OIL TEMPERATURE	-40 ÷ 120 °C
FILTRATION	25 µm or better
WEIGHT	0.13 kg

Continuous duty coil must be ordered separately, see section 02

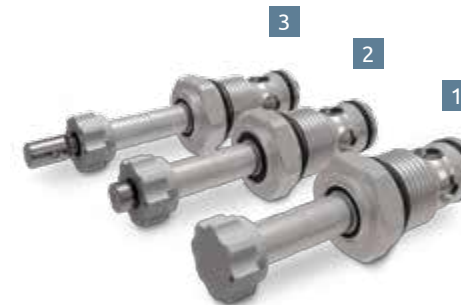
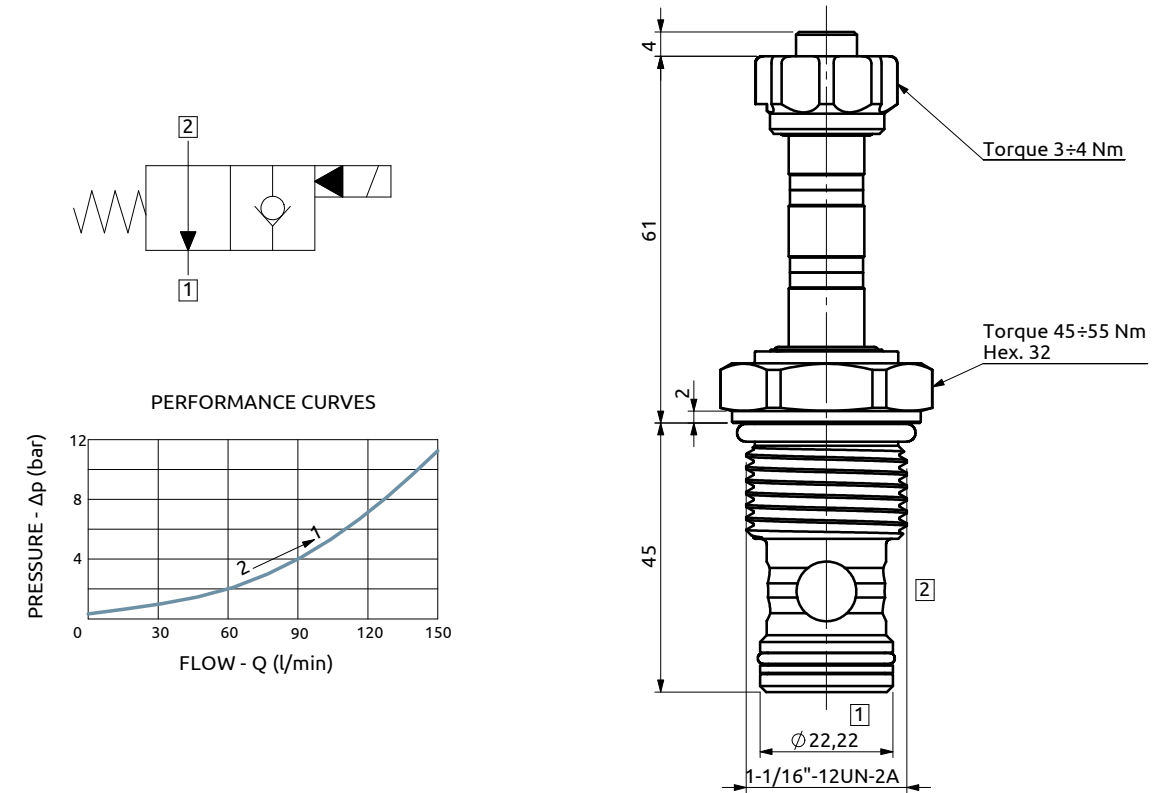


	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E221100000
2	Push button	E221102000
3	Push&twist button	E221103000

PRESSURE	350 bar
FLOW	70 l/min
CAVITY	SAE 10
SEALS	NBR

INTERNAL LEAKAGE	0.15 cc/min
OIL TEMPERATURE	-40 ÷ 120 °C
FILTRATION	25 µm or better
WEIGHT	0.16 kg

Continuous duty coil must be ordered separately, see section 02

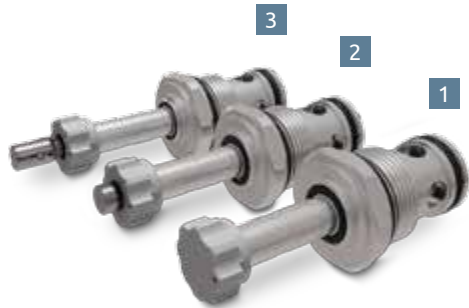
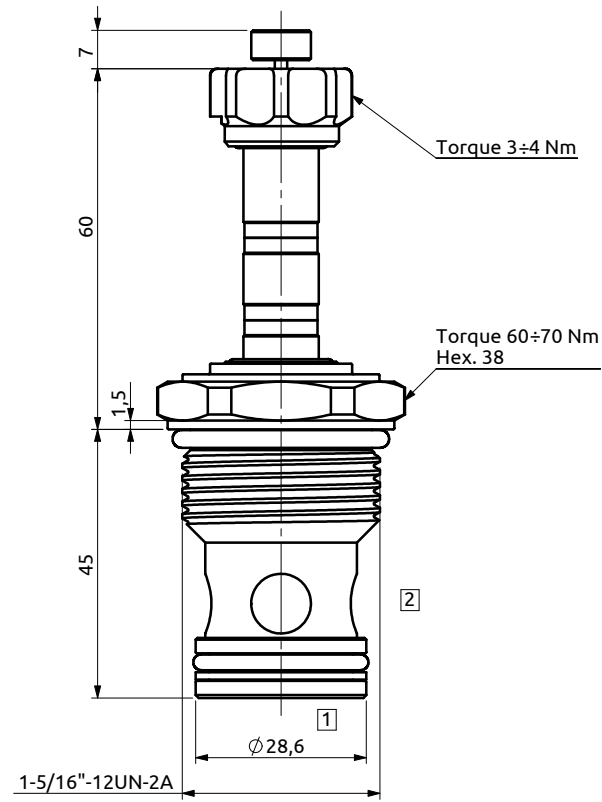
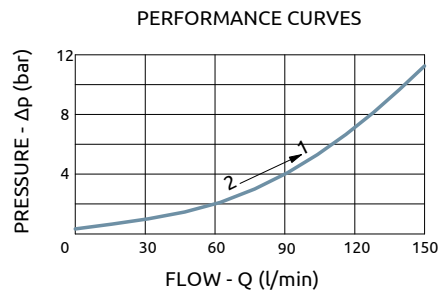
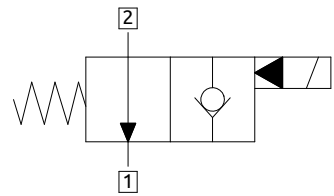


	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E221120000
2	Push button	E221122000
3	Push&twist button	E221123000

PRESSURE	350 bar
FLOW	150 l/min
CAVITY	SAE 12
SEALS	NBR

INTERNAL LEAKAGE	0.15 cc/min
OIL TEMPERATURE	-40 ÷ 120 °C
FILTRATION	25 µm or better
WEIGHT	0.23 kg

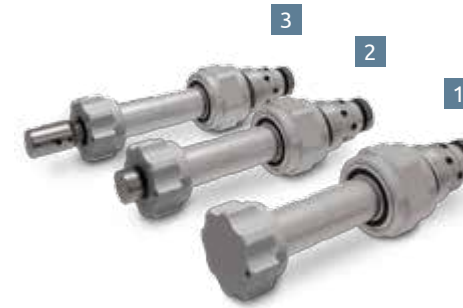
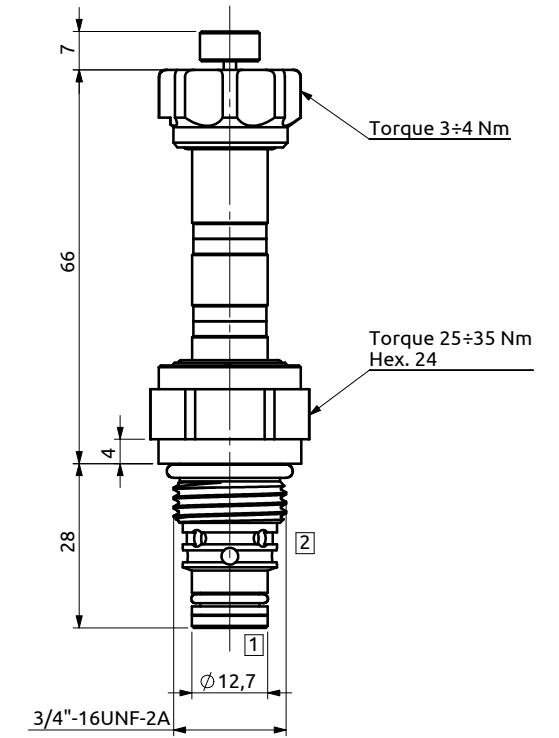
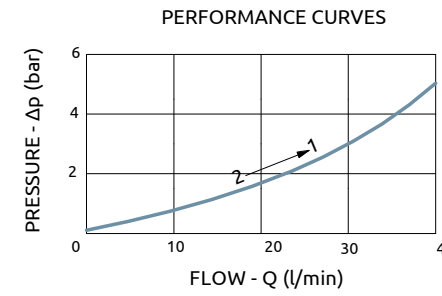
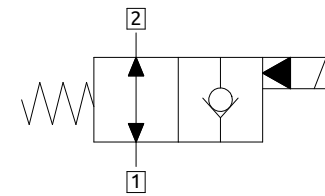
Continuous duty coil must be ordered separately, see section 02



	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E221160000
2	Push button	E221162000
3	Push&twist button	E221163000

PRESSURE	350 bar	INTERNAL LEAKAGE	0.15 cc/min
FLOW	150 l/min	OIL TEMPERATURE	-40 ÷ 120 °C
CAVITY	SAE 16	FILTRATION	25 µm or better
SEALS	NBR	WEIGHT	0.35 kg

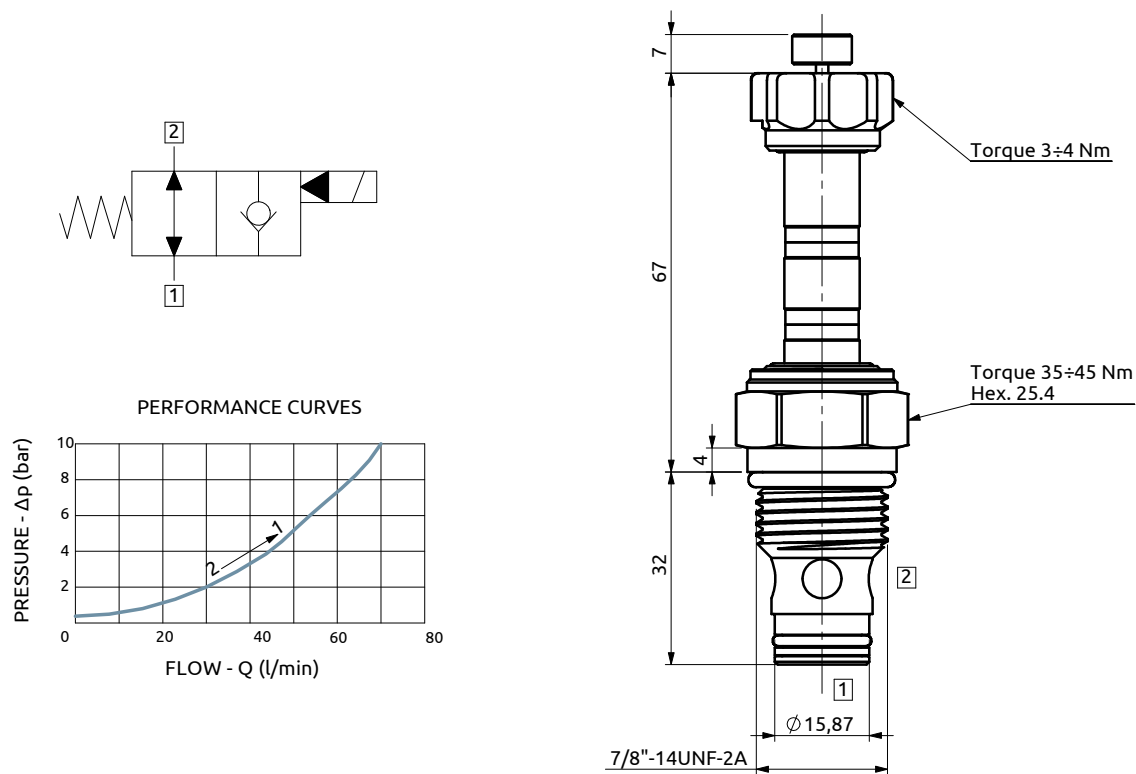
Continuous duty coil must be ordered separately, see section 02



	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E222080000
2	Push button	E222082000
3	Push&twist button	E222083000

PRESSURE	350 bar	INTERNAL LEAKAGE	0.15 cc/min
FLOW	40 l/min	OIL TEMPERATURE	-40 ÷ 120 °C
CAVITY	SAE 08	FILTRATION	25 µm or better
SEALS	NBR	WEIGHT	0.13 kg

Continuous duty coil must be ordered separately, see section 02

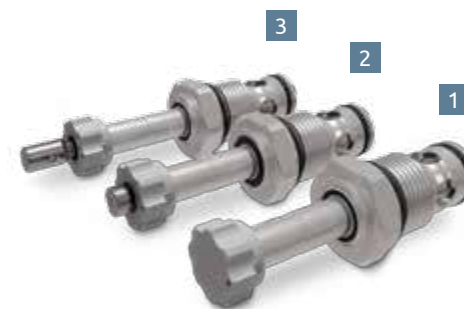
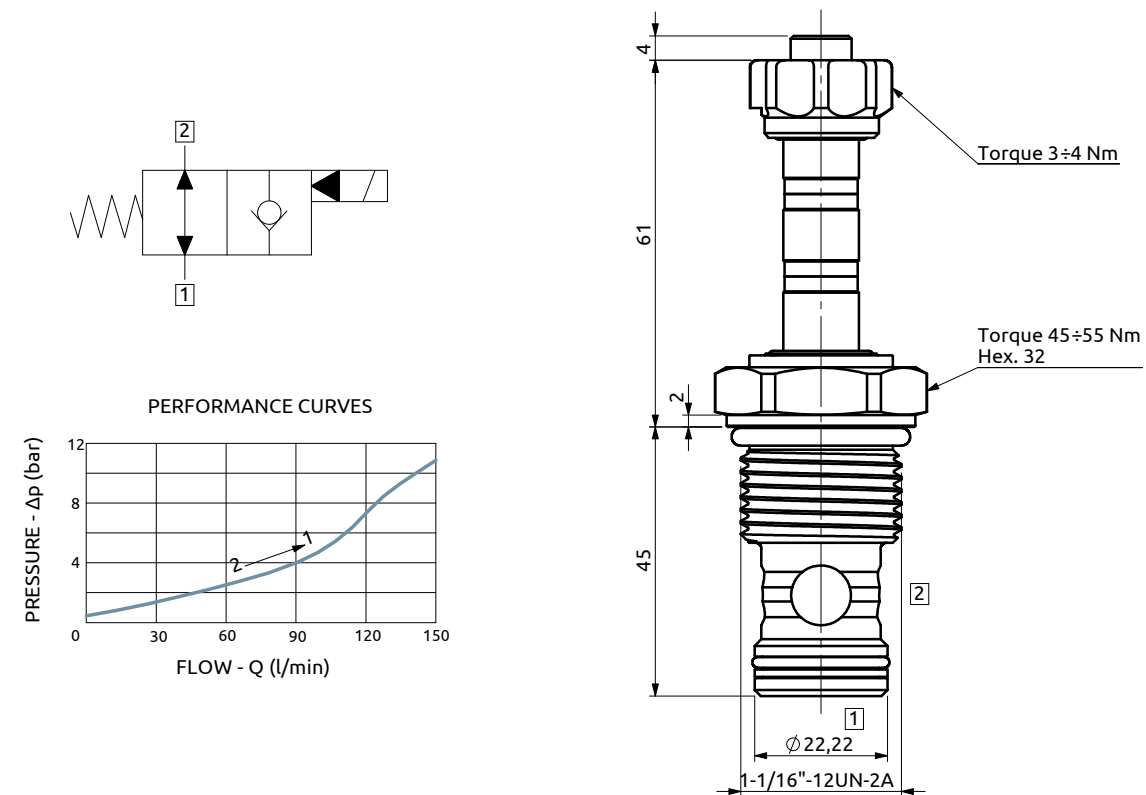


	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E222100000
2	Push button	E222102000
3	Push&twist button	E222103000

PRESSURE	350 bar
FLOW	70 l/min
CAVITY	SAE 10
SEALS	NBR

INTERNAL LEAKAGE	0.15 cc/min
OIL TEMPERATURE	-40 ÷ 120 °C
FILTRATION	25 µm or better
WEIGHT	0.16 kg

Continuous duty coil must be ordered separately, see section 02

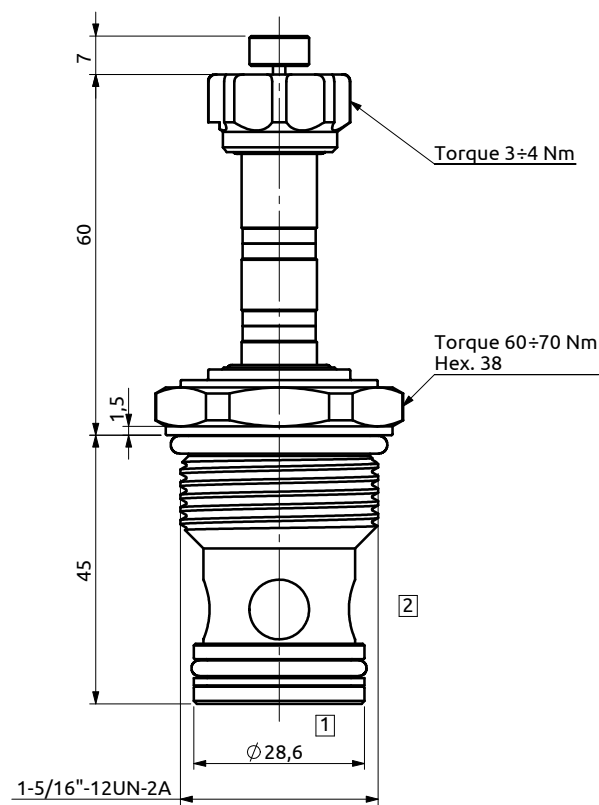
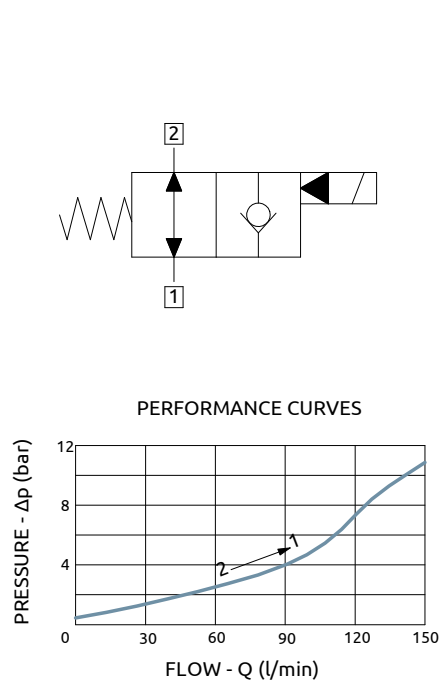


	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E222120000
2	Push button	E222122000
3	Push&twist button	E222123000

PRESSURE	350 bar
FLOW	150 l/min
CAVITY	SAE 12
SEALS	NBR

INTERNAL LEAKAGE	0.15 cc/min
OIL TEMPERATURE	-40 ÷ 120 °C
FILTRATION	25 µm or better
WEIGHT	0.23 kg

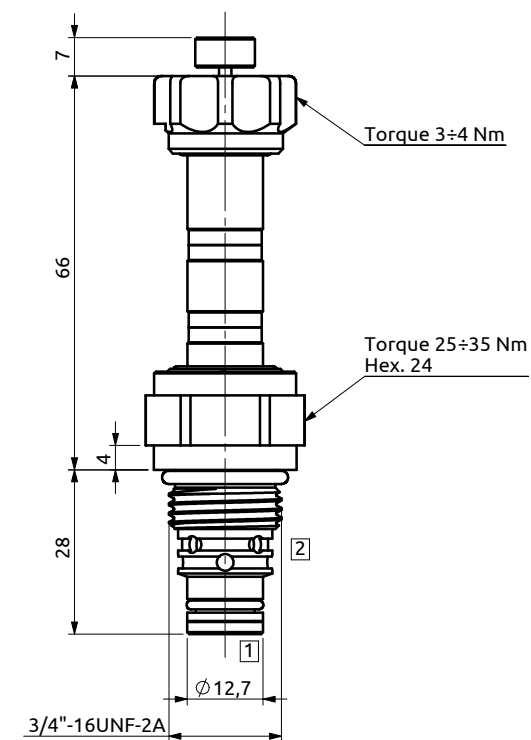
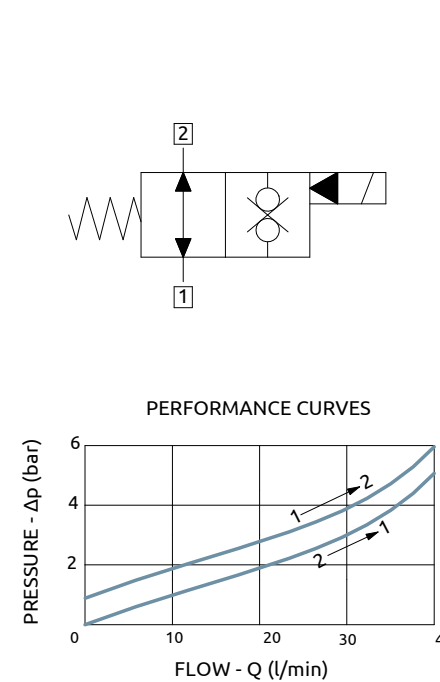
Continuous duty coil must be ordered separately, see section 02



	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E222160000
2	Push button	E222162000
3	Push&twist button	E222163000

PRESSURE	350 bar	INTERNAL LEAKAGE	0.15 cc/min
FLOW	150 l/min	OIL TEMPERATURE	-40 ÷ 120 °C
CAVITY	SAE 16	FILTRATION	25 μm or better
SEALS	NBR	WEIGHT	0.35 kg

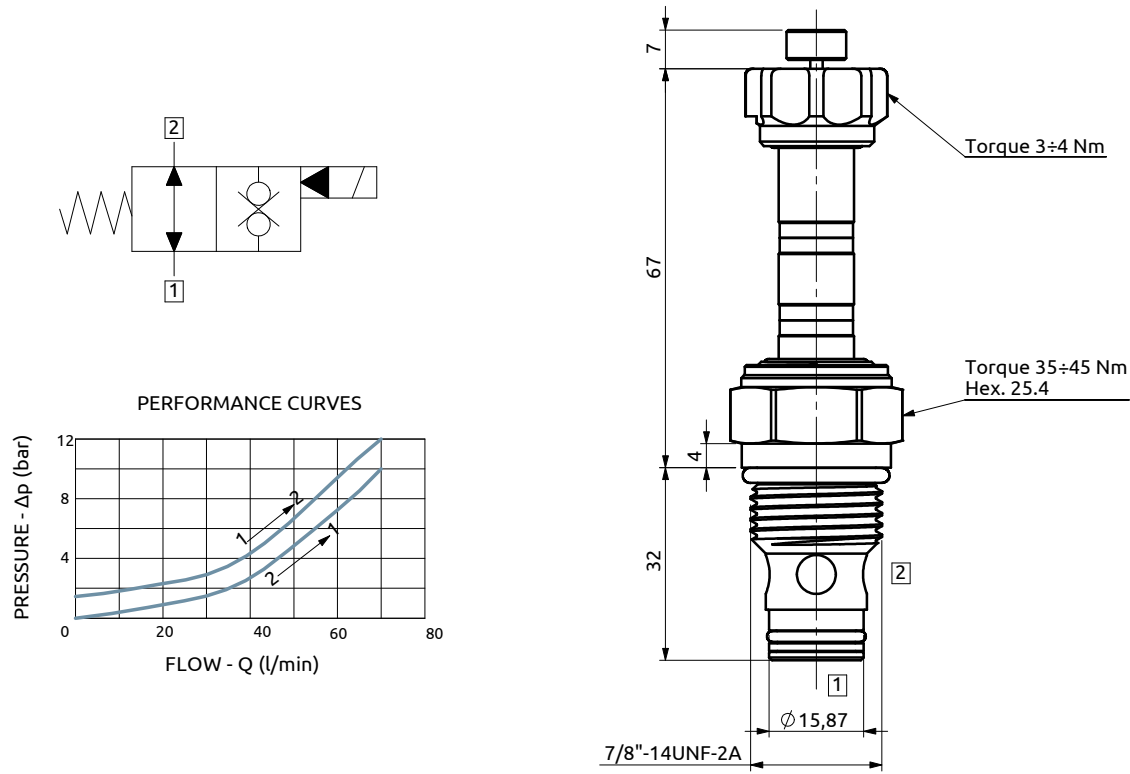
Continuous duty coil must be ordered separately, see section 02



	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E223080000
2	Push button	E223082000
3	Push&twist button	E223083000

PRESSURE	350 bar	INTERNAL LEAKAGE	0.15 cc/min
FLOW	40 l/min	OIL TEMPERATURE	-40 ÷ 120 °C
CAVITY	SAE 08	FILTRATION	25 μm or better
SEALS	NBR	WEIGHT	0.13 kg

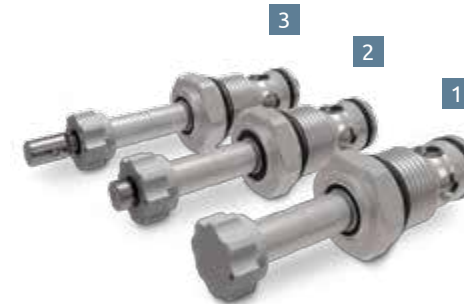
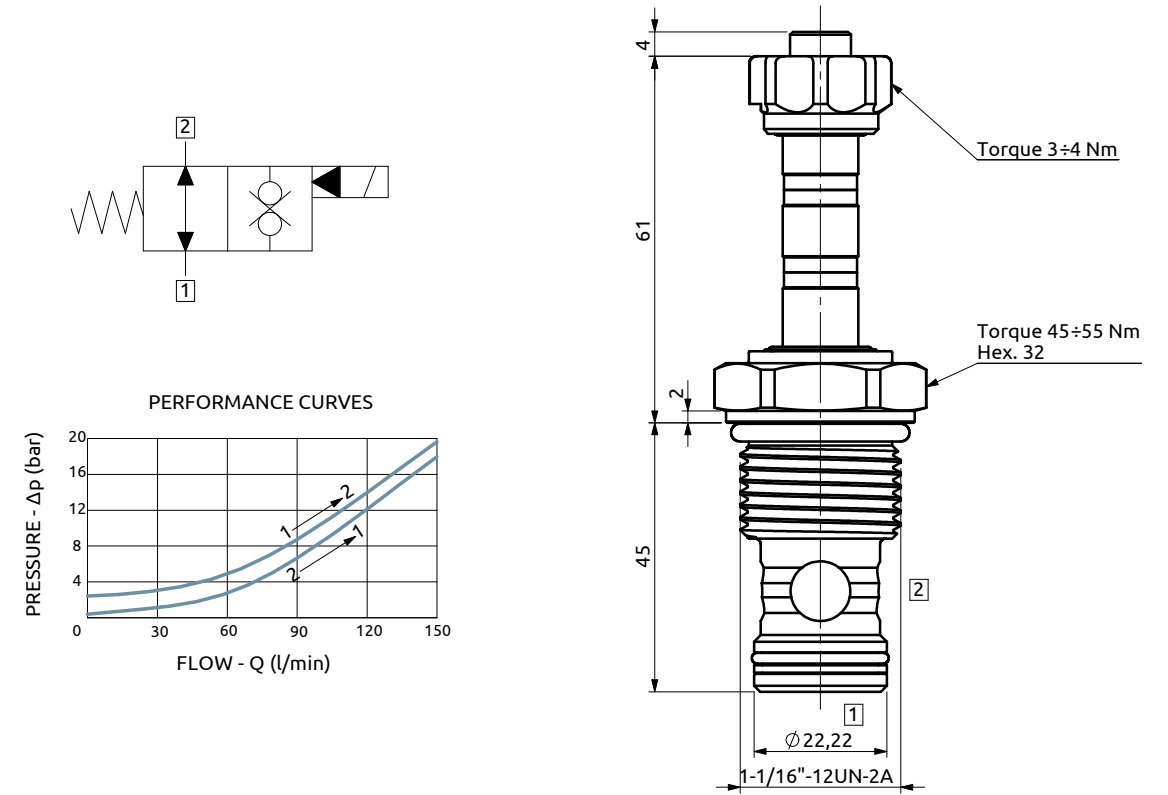
Continuous duty coil must be ordered separately, see section 02



	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E223100000
2	Push button	E223102000
3	Push&twist button	E223103000

PRESSURE	350 bar	INTERNAL LEAKAGE	0.15 cc/min
FLOW	70 l/min	OIL TEMPERATURE	-40 ÷ 120 °C
CAVITY	SAE 10	FILTRATION	25 µm or better
SEALS	NBR	WEIGHT	0.16 kg

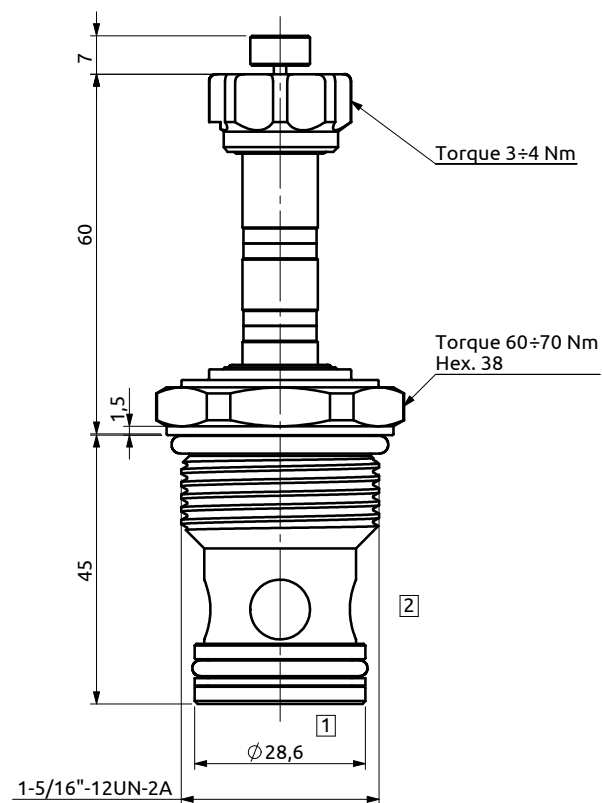
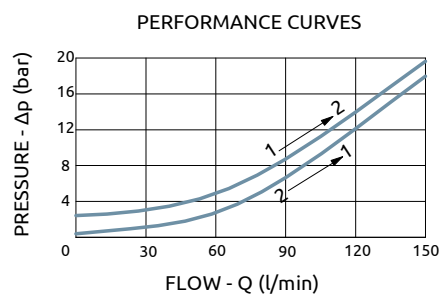
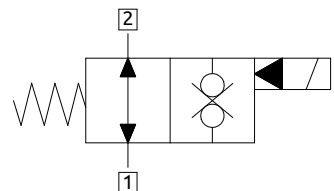
Continuous duty coil must be ordered separately, see section 02



	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E223120000
2	Push button	E223122000
3	Push&twist button	E223123000

PRESSURE	350 bar	INTERNAL LEAKAGE	0.15 cc/min
FLOW	150 l/min	OIL TEMPERATURE	-40 ÷ 120 °C
CAVITY	SAE 12	FILTRATION	25 µm or better
SEALS	NBR	WEIGHT	0.23 kg

Continuous duty coil must be ordered separately, see section 02



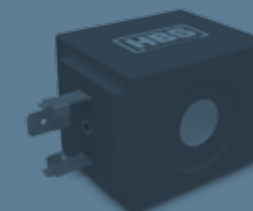
	MANUAL OVERRIDE	ORDERING CODE
1	Not adjustable	E223160000
2	Push button	E223162000
3	Push&twist button	E223163000

PRESSURE	350 bar
FLOW	150 l/min
CAVITY	SAE 16
SEALS	NBR

INTERNAL LEAKAGE	0.15 cc/min
OIL TEMPERATURE	-40 ÷ 120 °C
FILTRATION	25 µm or better
WEIGHT	0.35 kg

Continuous duty coil must be ordered separately, see section 02

Continuous duty coil



The various versions of the coil allow use in both AC and DC. Coils with different voltages and with DIN43650, AMP JUNIOR and DEUTSCH connectors are also available in the catalogue or on-demand.

Heat insulation class: H ($T_{max} = 356^{\circ}F$)
Ambient temperature range: $-86+140^{\circ}F$

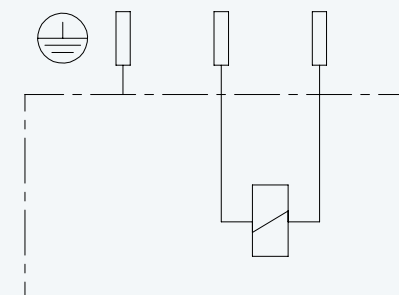
In order to use the coil in continuous service you must respect the following formula:

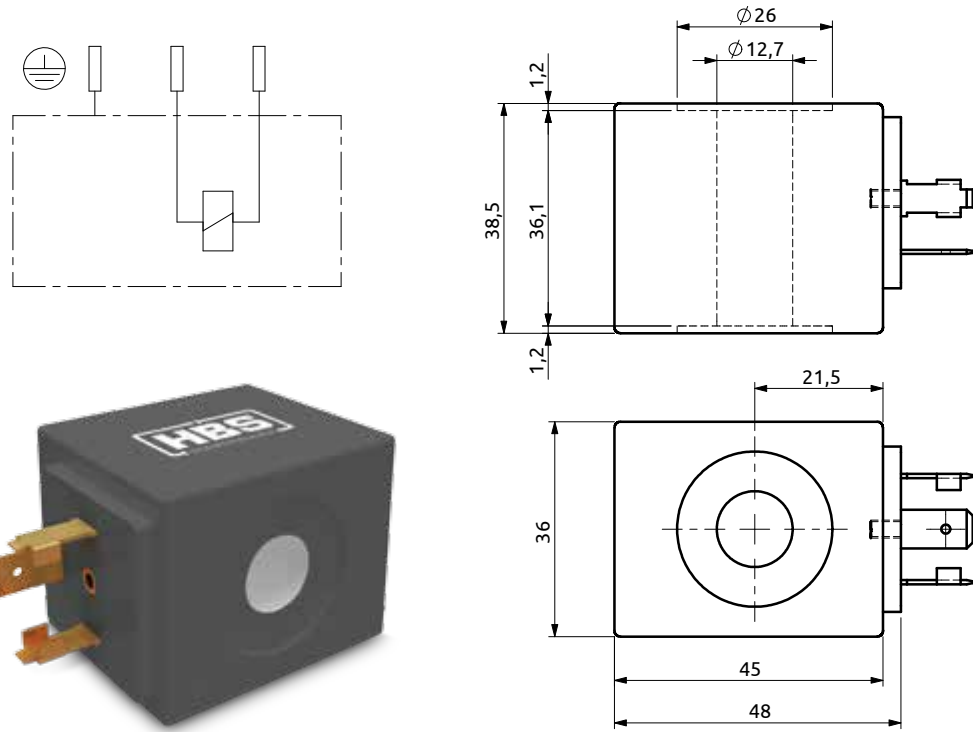
$$T_{amb} + \Delta T < T_{max}$$

where

T_{amb} = ambient temperature
 ΔT = temperature increase due to the operation
 T_{max} = maximum allowable temperature

Inlet voltage fluctuation must not exceed $\pm 10\%$ of nominal voltage to guarantee correct operation and long life of coil.



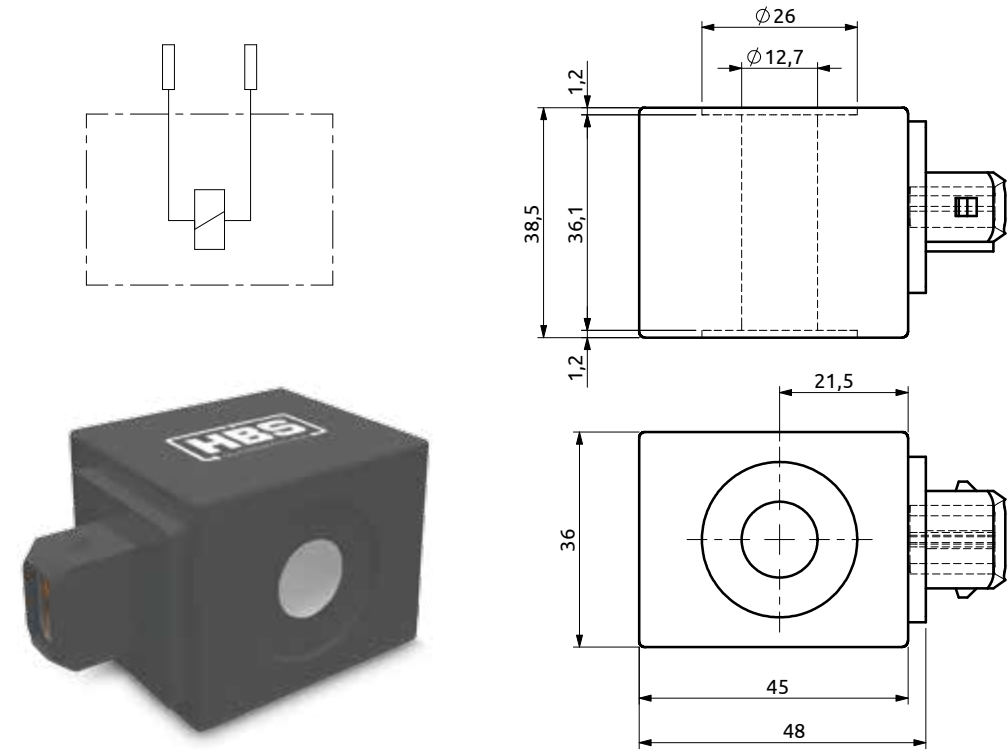


ORDERING CODE	TYPE OF CURRENT	VOLTAGE (V)	POWER (W)	RESISTANCE (Ω) 68-77°F	CURRENT (A) COLD COIL - HOT COIL
EB1101220100	DC	12	20	7.5±7%	1.66 - 1.06
EB1102420100	DC	24	20	20.0±7%	0.88 - 0.53
EB1102620100	DC	26	20	34.2±7%	0.77 - 0.52
EB1102820100	DC	28	20	39.2±7%	0.71 - 0.50
EB1103620100	DC	36	20	64.0±7%	0.56 - 0.36
EB1202420100	RAC	24	20	23.2±7%	0.95 - 0.63
EB1211020100	RAC	110	20	470.0±7%	0.19 - 0.14
EB1222020100	RAC	220	20	1910.0±7%	0.09 - 0.07

TYPE OF CONNECTOR	DIN43650-ISO4400
HEAT INSULATION CLASS	H (180°C / 356° F)
AMBIENT TEMPERATURE RANGE	-30 ÷ 60°C / -86 ÷ 140°F
WEIGHT	0.22 kg
ENCAPSULATING MATERIAL	PET

Inlet voltage fluctuation must not exceed ±10% of nominal voltage to guarantee correct operation and long life of coil

Available different voltages



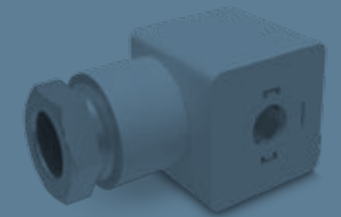
ORDERING CODE	TYPE OF CURRENT	VOLTAGE (V)	POWER (W)	RESISTANCE (Ω) 68-77°F	CURRENT (A) COLD COIL - HOT COIL
EB1101020200	DC	10	20	5.0±8%	1.98 - 1.28
EB1101220200	DC	12	20	7.5±7%	1.66 - 1.06
EB1102020200	DC	20	20	7.5±7%	0.99 - 0.65
EB1102420200	DC	24	20	20.0±7%	0.88 - 0.53
EB1102620200	DC	26	20	34.2±7%	0.77 - 0.52
EB1102820200	DC	28	20	39.2±7%	0.71 - 0.50
EB1103620200	DC	36	20	64.0±7%	0.56 - 0.36
EB1104820200	DC	48	20	110.0±7%	0.45 - 0.28

TYPE OF CONNECTOR	AMP JUNIOR
HEAT INSULATION CLASS	H (180°C / 356° F)
AMBIENT TEMPERATURE RANGE	-30 ÷ 60°C / -86 ÷ 140°F
WEIGHT	0.22 kg
ENCAPSULATING MATERIAL	PET

Inlet voltage fluctuation must not exceed ±10% of nominal voltage to guarantee correct operation and long life of coil

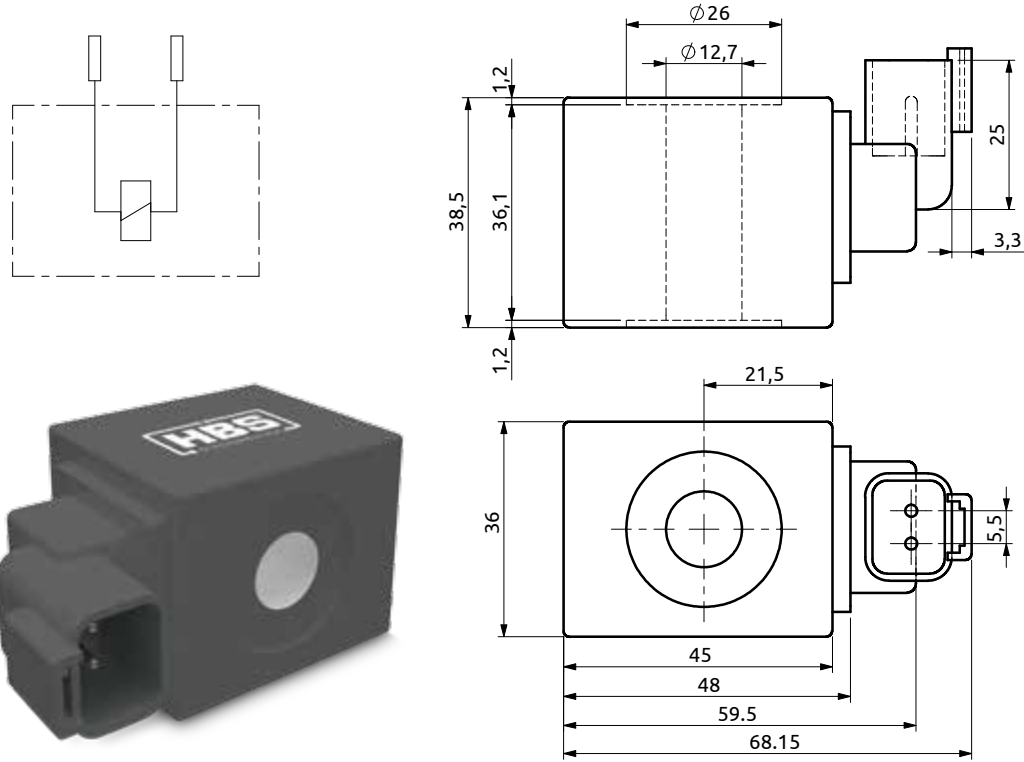
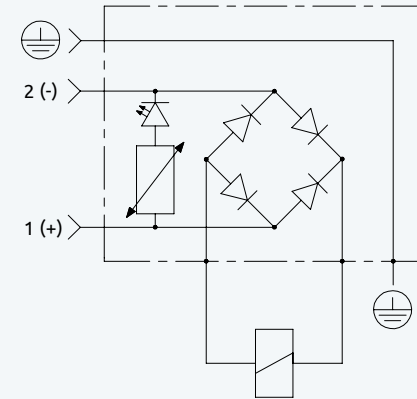
Available different voltages

Connectors



The various versions of the connectors allow use in both DC and AC integrating a voltage rectifier with diode bridge.

Protection class: IP65

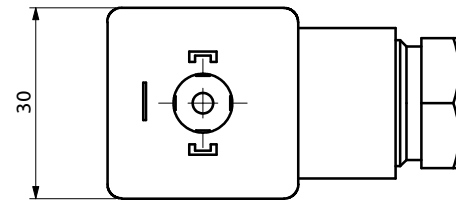
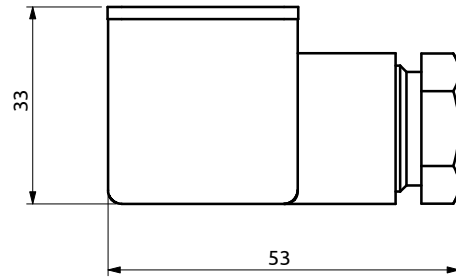
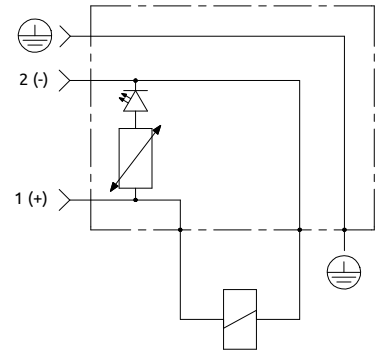


ORDERING CODE	TYPE OF CURRENT	VOLTAGE (V)	POWER (W)	RESISTANCE (Ω) 68-77°F	CURRENT (A) COLD COIL - HOT COIL
EB1101020300	DC	10	20	5.0±8%	1.98 - 1.28
EB1101220300	DC	12	20	7.5±7%	1.66 - 1.06
EB1102020300	DC	20	20	7.5±7%	0.99 - 0.65
EB1102420300	DC	24	20	20.0±7%	0.88 - 0.53
EB1102620300	DC	26	20	34.2±7%	0.77 - 0.52
EB1102820300	DC	28	20	39.2±7%	0.71 - 0.50
EB1103620300	DC	36	20	64.0±7%	0.56 - 0.36
EB1104820300	DC	48	20	110.0±7%	0.45 - 0.28

TYPE OF CONNECTOR	DEUTSCH DT04-2P
HEAT INSULATION CLASS	H (180°C / 356° F)
AMBIENT TEMPERATURE RANGE	-30 ÷ 60°C / -86 ÷ 140°F
WEIGHT	0.22 kg
ENCAPSULATING MATERIAL	PET

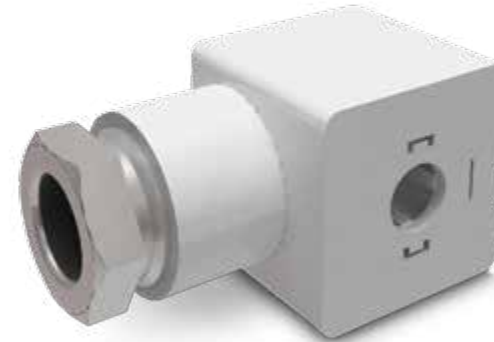
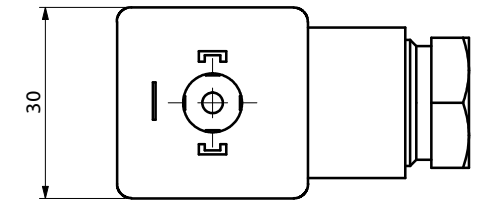
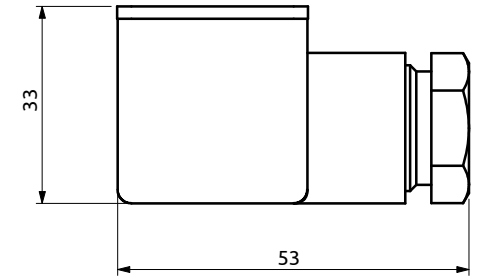
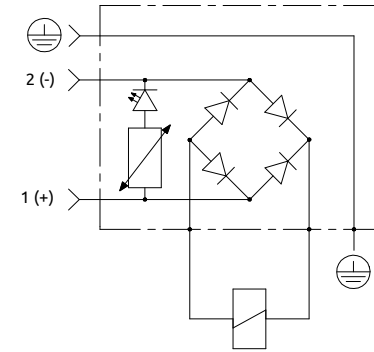
Inlet voltage fluctuation must not exceed ±10% of nominal voltage to guarantee correct operation and long life of coil

Available different voltages



ORDERING CODE	CONNECTOR	TYPE OF CURRENT	VOLTAGE (V)	NOMINAL CURRENT CAPACITY (A)	MAX. CURRENT CAPACITY (A)
EC01101100	DIN43650	DC	12 - 24	10	16

CONTACT RESISTANCE	4 m Ω
MAX. WIRE SECTION AREA	1.5 mm ²
CABLE GLAND THREAD	Pg9 - DIN40430
ELECTRICAL INSULATION CLASS	C - DIN VED 0110
INSTALLATION TORQUE	3 ÷ 4 Nm
CABLE DIAMETER	6 ÷ 8 mm
PROTECTION CLASS	IP65 - DIN40050 part9
NUMBER OF POLES	2 + Earth
CIRCUIT	Standard with LED

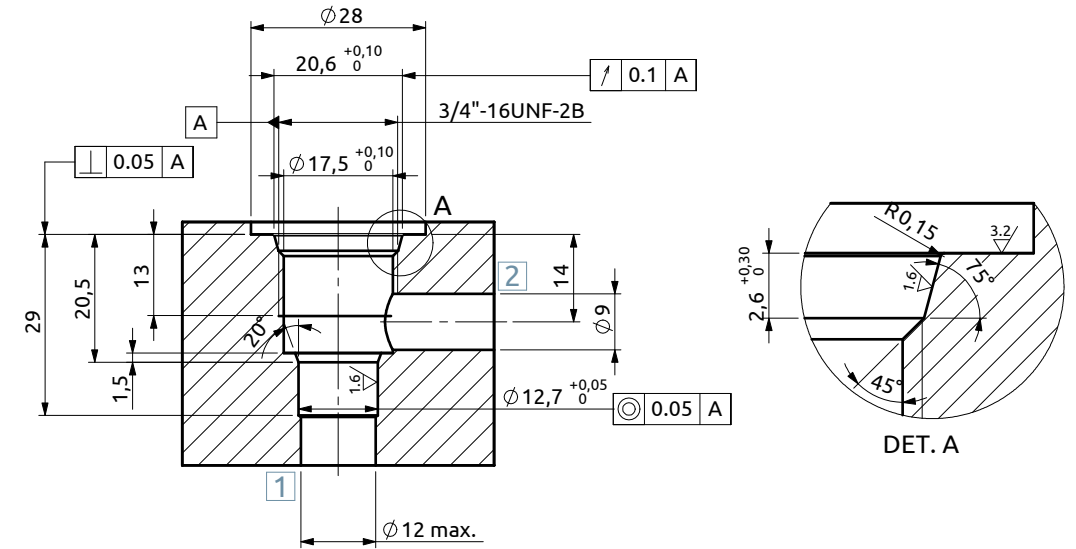


ORDERING CODE	CONNECTOR	TYPE OF CURRENT	VOLTAGE (V)	NOMINAL CURRENT CAPACITY (A)	MAX. CURRENT CAPACITY (A)
EC01202100	DIN43650	RAC	110	10	16
EC01203100	DIN43650	RAC	220	10	16

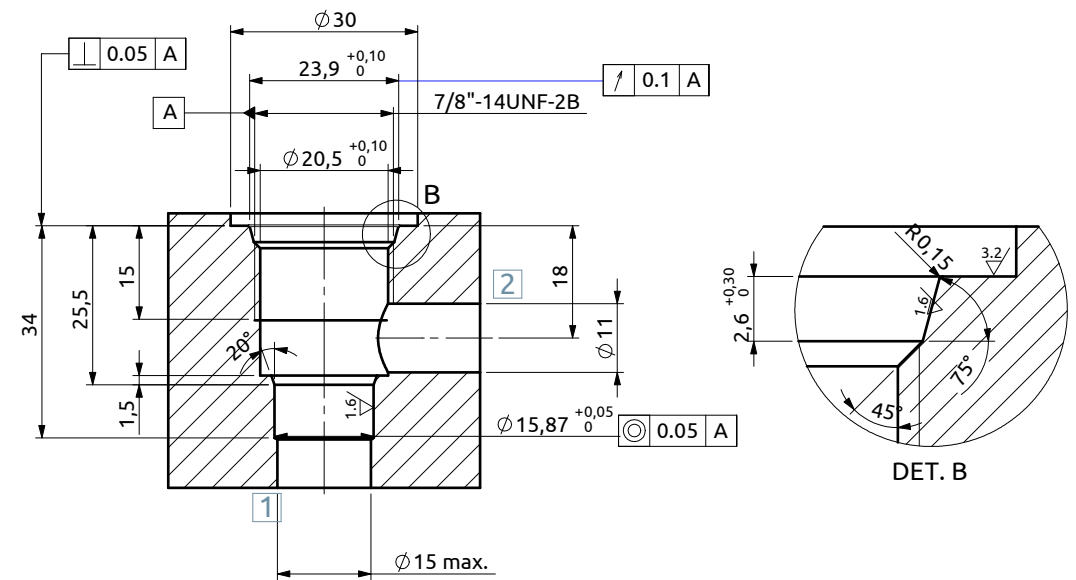
CONTACT RESISTANCE	4 m Ω
MAX. WIRE SECTION AREA	1.5 mm ²
CABLE GLAND THREAD	Pg9 - DIN40430
ELECTRICAL INSULATION CLASS	C - DIN VED 0110
INSTALLATION TORQUE	3 ÷ 4 Nm
CABLE DIAMETER	6 ÷ 8 mm
PROTECTION CLASS	IP65 - DIN40050 part9
NUMBER OF POLES	2 + Earth
CIRCUIT	With full wave Rectifier with LED
DIODE CURRENT CAPACITY	1 A

		OPEN PLASTIC NUT	CLOSED PLASTIC NUT	MEDIUM SECURITY COVER	HIGH SECURITY COVER
ORDERING CODE		EA1000	EA2000	EA3000	EA4000
MANUAL EXCLUSION	NOT ADJUSTABLE				
	MANUAL SCREW				
	PUSH BUTTON				
	PUSH&TWIST BUTTON				

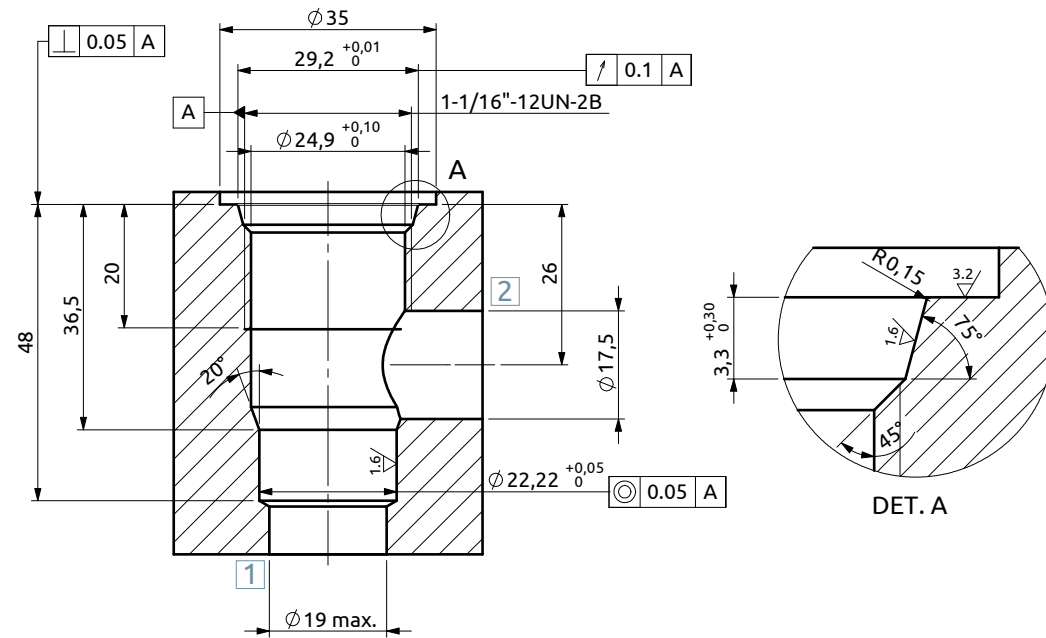
SAE 08



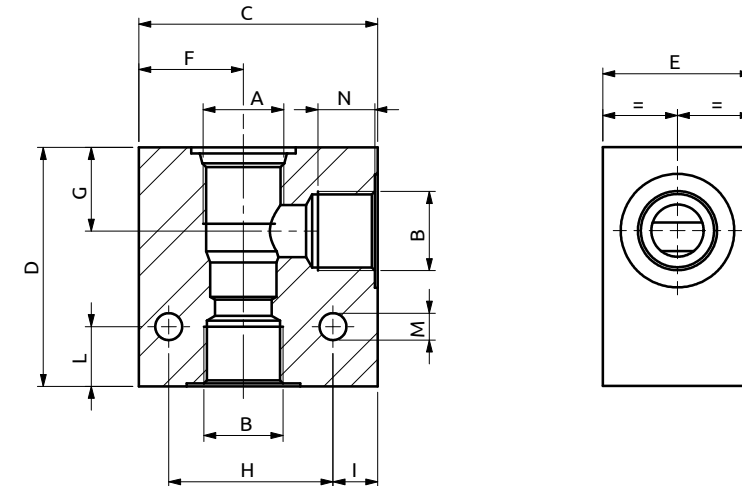
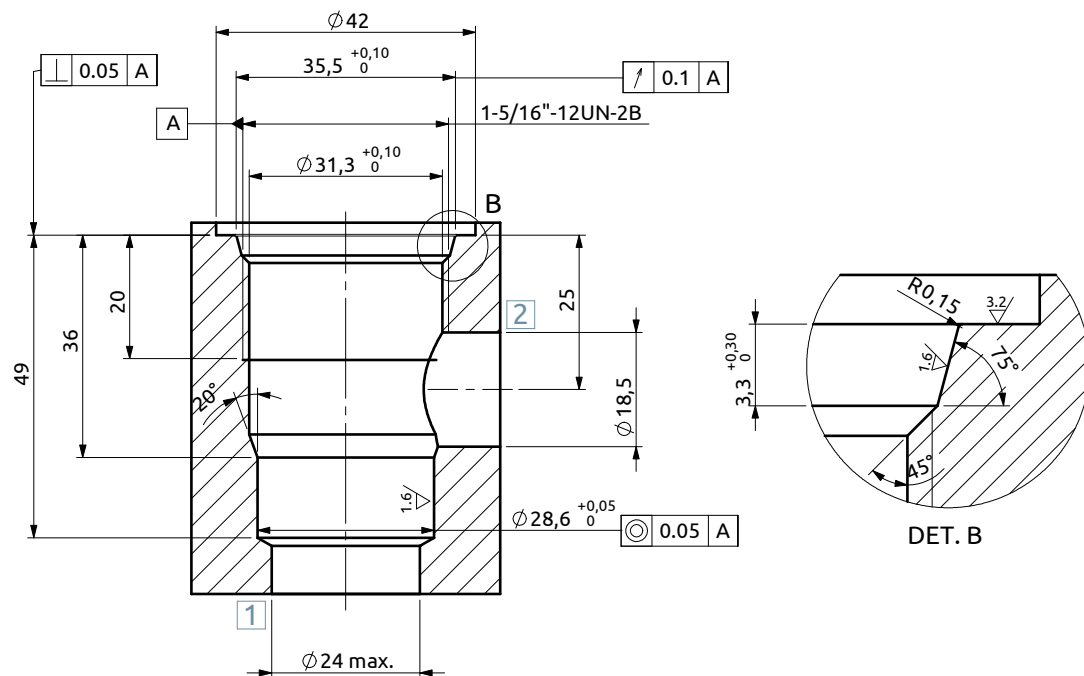
SAE 10



SAE 12



SAE 16



ORDERING CODE	CAVITY A	B	C	D	E	F	G	H	I	L	M	N
EM X 202080000	SAE 08	G 1/4	50	50	30	21	15	35	9	12	7	14
EM X 203080000	SAE 08	G 3/8	50	50	30	21	15	35	9	12	7	17
EM X 291080000	SAE 08	7/16-20	50	50	30	21	15	35	9	12	7	14
EM X 292080000	SAE 08	9/16-18	50	50	30	21	15	35	9	12	7	17
EM X 203100000	SAE 10	G 3/8	60	60	35	25	19	45	7	15	7	17
EM X 204100000	SAE 10	G 1/2	60	60	35	25	19	45	7	15	7	19
EM X 206100000	SAE 10	G 3/4	70	60	40	30	20	55	9	15	9	22
EM X 292100000	SAE 10	9/16-18	60	60	35	25	19	45	7	15	7	17
EM X 293100000	SAE 10	3/4-16	60	60	35	25	19	45	7	15	7	19
EM X 294100000	SAE 10	7/8-14	60	60	35	25	19	45	7.5	15	7	22
EM X 204120000	SAE 12	G 1/2	80	75	40	35	26.5	60	10	20	9	19
EM X 206120000	SAE 12	G 3/4	80	75	40	35	26.5	60	10	20	9	22
EM X 206160000	SAE 16	G 3/4	80	80	50	32	26	60	10	22	9	22
EM X 208160000	SAE 16	G 1	90	80	50	37	26	60	20	22	9	30
EM X 296160000	SAE 16	1-1/16-12	80	80	50	32	26	60	10	22	9	22

	STEEL BODY	ALUMINIUM BODY
X	A	B

ORDERS

Any order must be sent in writing to HBS S.p.a and filled with the following: full name, address and fiscal data of the Customer, the delivery of material and documents address if different from the invoice address, order number, note of any special offer or agreement which must be still valid at time of ordering, despatch date, exact quantities and delivery date, the courier and the payment terms. The order must show the HBS codes, it is not sufficient to only use the sole Customer code or reference.

HBS S.p.a. reserves the right to decline the order or to request for integration if it is considered incomplete; in case there is not positive feedback within 7 days from the written order confirmation the Customer has to consider the order not confirmed. Any verbal agreements with HBS personnel or resellers must be always followed by a written confirmation by HBS s.pa.

WARRANTY

HBS guarantees the original products are free from defects in workmanship or material for a period of 12 months from the installation date on the machine documented by time incontrovertible and unalterable elements. The warranty is valid since when the valves have been installed, and operated in accordance to the HBS use and technical details. They must be assembled on the machine within 6 months from the date stamped on the valve, in lack of proof documentation about the real installation date, warranty will start from this last term, also if preceding the installation.

External seals are not covered by the warranty. The warranty is referred only to the original purchaser and lapses in case of manumission, any modify without written permission, improper use or fluid

pollution. The warranty request has to be notified directly to HBS, in a completed written report with the fault indicated. The valves can be returned to HBS only after written acceptance by HBS. HBS will only replace or repair the valves after the explicit authorization from our technicians at the HBS premises, or if agreed by HBS at the Customer's site too. HBS do not provide a refund or credit against any costs of disassembling, repairing, replacing or loss of profit for the machine out of work.

Recall Campaign: HBS shall only agree to recall products where there is evidence of re-occurring faults. HBS will not be liable in cases where the valves are used on machines where they are capable of producing damages much greater than the production costs to third persons.

Also it is always the responsibility of the Customer to take all necessary safety measure during the design of the machines or hydraulic circuits to ensure avoidance of such damages or injuries. Warranty includes only elements bought and sold by HBS; HBS is not liable for indirect damages.

JURISDICTION

HBS S.p.a reserves the right to stop the production or to modify the dimension or technical feature of its production shown in this catalogue without any prior warning or obligation. Customising of HBS products, will only be modified after the agreement with the Customer. In case of disagreement between parties the production can be stopped at any time. Without any written permission partial or total reproduction of this catalogue is strictly prohibited.

In case of any disputes the sole jurisdiction for any settlement is referred to the Law Court Of Mantova.

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H. B. S. Co. Beijing LTD

Beijing China

Phone: 18500612111 17710099072

E-mail: ticoliu@163.com