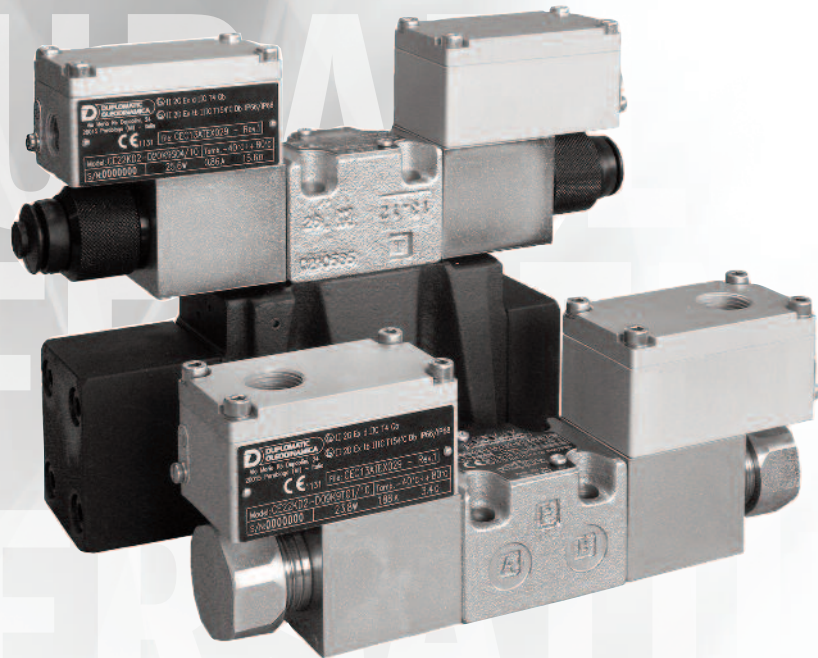




CONTINENTAL HYDRAULICS

VED*HL-* -KD2

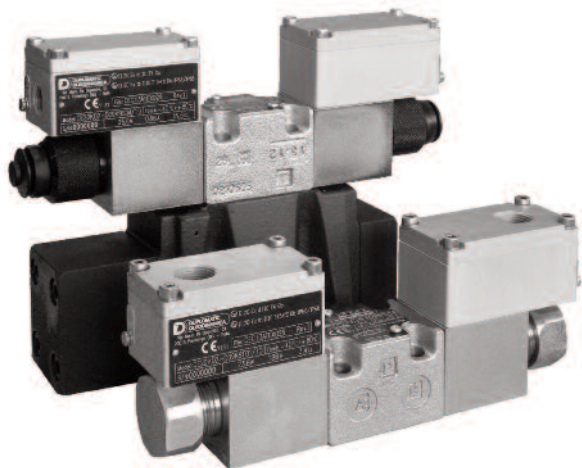
HAZARDOUS LOCATION, PROPORTIONAL, DIRECT & PILOT OPERATED VALVES
(IN COMPLIANCE WITH ATEX 94/4/EC)



VED*HL-* -KD2 - HAZARDOUS LOCATION, PROPORTIONAL, DIRECT & PILOT OPERATED VALVES

VED*HL-*-KD2

HAZARDOUS LOCATION, PROPORTIONAL, DIRECT & PILOT OPERATED VALVES



DESCRIPTION

The VED**HL proportional, direct & pilot operated valves are in compliance with ATEX 94/9/EC standards. They are suitable for use in potentially explosive atmospheres which fall within the ATEX II 2GD classification for gas and dust. See pages 18 and 19 for ATEX classification, operating temperatures and electrical characteristics.

The VED03HL valve is supplied with a Zinc-Nickel surface treatment to ensure a salt spray resistance of up to 600 h. (test conducted per UNI EN ISO 9227 and evaluated per UNI EN ISO 10289). The Zinc-Nickel surface treatment is available on the pilot operated valves upon request.

A statement of conformity to the applicable standards is supplied with each valve.

The label and electrical box on these valves have a concentration of magnesium lower than the critical value of 7.5% for the Hazardous Environments.

TYPICAL PERFORMANCE SPECIFICATIONS

		VED03HL	VED#HL
HYSTERESIS	% of Q max	<6% (PWM 200 Hz)	<4% (PWM 100 Hz)
REPEATABILITY	% of Q max	< ± 1.5%	< ± 2%
POWER SUPPLY		12V DC / 24V DC	

TYPICAL PERFORMANCE SPECIFICATIONS

		VED03HL		VED05*HL		VED07HL		VED08HL		VED10HL	
MAXIMUM OPERATING PRESSURE	P - A - B Ports	5000 psi	350 bar	5000 psi	350 bar	5000 psi	350 bar	5000 psi	350 bar	5000 psi	350 bar
	T Port (Ext. Drain)	-	-	3600 psi	250 bar	3600 psi	250 bar	3600 psi	250 bar	3600 psi	250 bar
	T Port (Int. Drain)	3000 psi	210 bar	145 psi	10 bar	145 psi	10 bar	145 psi	10 bar	145 psi	10 bar
PILOT PRESSURE	Minimum	-	-	435 psi	30 bar	435 psi	30 bar	435 psi	30 bar	435 psi	30 bar
	Maximum	-	-	3000 psi	210 bar	3000 psi	210 bar	3000 psi	210 bar	3000 psi	210 bar
MAX FLOW RATE		20 gpm	76 l/min	48 gpm	180 l/min	119 gpm	450 l/min	211 gpm	800 l/min	423 gpm	1600 lpm
MOUNTING SURFACE		NFPA D03 ISO 4401-03-02-0-03		NFPA D05 alt. A/alt. B ISO 4401-05-05-0-05		NFPA D07 ISO 4401-07-07-0-05		NFPA D08 ISO 4401-08-08-0-05		NFPA D10 ISO 4401-10-09-0-05	
MAX WEIGHT		6.2 lbs	2.8 kg	18.3 lbs	8.3 kg	23.6 lbs	10.7 kg	37.3 lbs	16.9 kg	118 lbs	53.5 kg

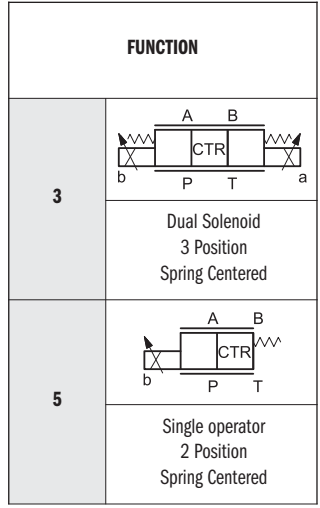
IDENTIFICATION CODE - HAZARDOUS LOCATION - DIRECT OPERATED

VED03HL - [] - [] - [] - [] - [] - KD2 [] - [] D - [] — DESIGN LETTER

D03 SIZE
HAZARDOUS LOCATION

VALVE ATEX APPROVAL
For gases, vapors, mists: EX II 2G IIC T4 Gb
For dust: EX II 2D IIIC T 154°C Db
(protection type of the coil "d")

SOLENOIDS
see codes on page 20



SEAL	TEMP RANGE
A Buna (STD)	-20 to +80°C -4 to +176°F
G Viton	
AL Buna (low temp)	-40 to +80°C -40 to +176°F

MECHANICAL OPTIONS OMIT IF NOT REQUIRED	
R	Reverse Mode Sol. A supplied
F	Blind Retainer (STD for AL seal) see page 16
H	Lever manual override (see page 16)

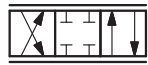

TEMPERATURE CLASS	
OMIT	T4 (STD)
T5	T5 class (see page 20)

NOMINAL FLOW (with Δp P-T 143 psi)	
04	4 l/min (1.06 gpm)
08	8 l/min (2.1 gpm)
16	16 l/min (4.2 gpm)
26	26 l/min (7 gpm)
16/08	Asymmetrical spool: 16 l/min (4.2 gpm) on P-A 8 l/min (2.1 gpm) on P-B
26/13	Asymmetrical spool: 26 l/min (7 gpm) on P-A 13 l/min (3.5 gpm) on P-B

TERMINAL BLOCK CONNECT	
T01	TOP: M20 x 1.5 ISO 261
T02	TOP: Gk 1/2 UNI EN 10226-2
T03	TOP: 1/2" NPT ANSI B1.20.1 (ex ANSI B 2.1)
S01	SIDE: M20 x 1.5 ISO 261 (available upon request only)
S04	SIDE: M16 x 1.5 ISO 261 (only for 24V)

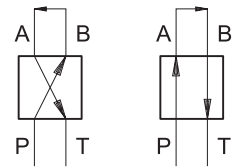
TYPICAL ORDERING CODE:
VED03HL-3AC-26-AT03-KD2-12D-A

NOTE:
The Zinc-Nickel body finishing surface treatment ensures a salt spray resistance up to 600 h (test operated according to UNI EN ISO 9227 standards and test evaluation operated according to UNI EN ISO 10289).

SPOOLS				
NAME	SYMBOL	DESCRIPTION	APPLICATION	FUNCTION MATCHING
AC		METER IN / METER OUT	MOTION	3, 5
FC				

PERFORMANCE CURVES FOR AC SPOOL

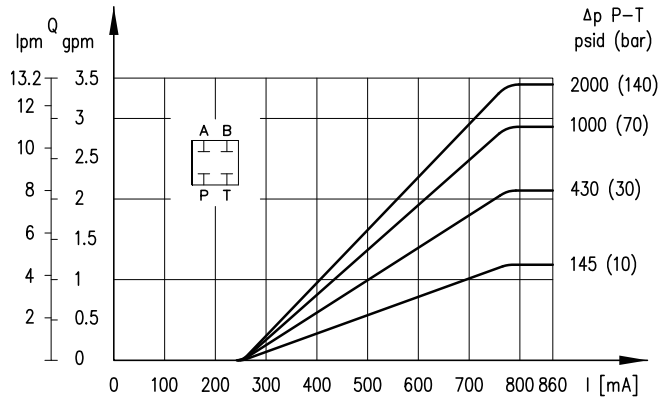
Curves obtained with mineral oil viscosity of 170 sus (36 cSt) at 122°F (50°C); the Δp values are measured between P and T (full loop) valve ports.



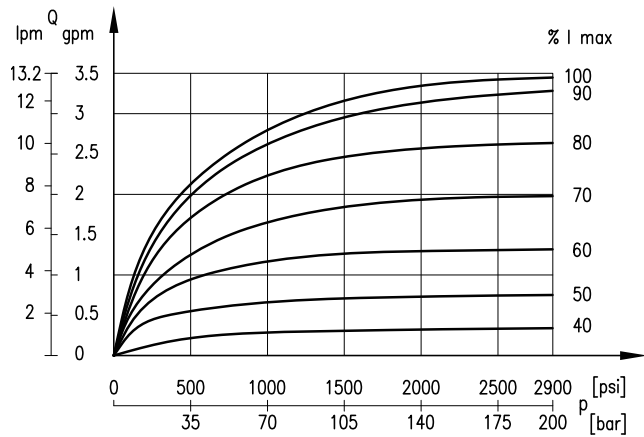
VED*HL*-KD2 - HAZARDOUS LOCATION, PROPORTIONAL, DIRECT & PILOT OPERATED VALVES

AC-04

FLOW CHARACTERISTICS

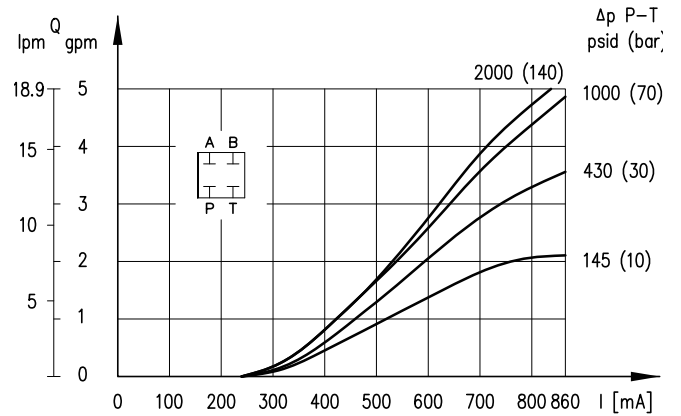


OPERATING LIMITS

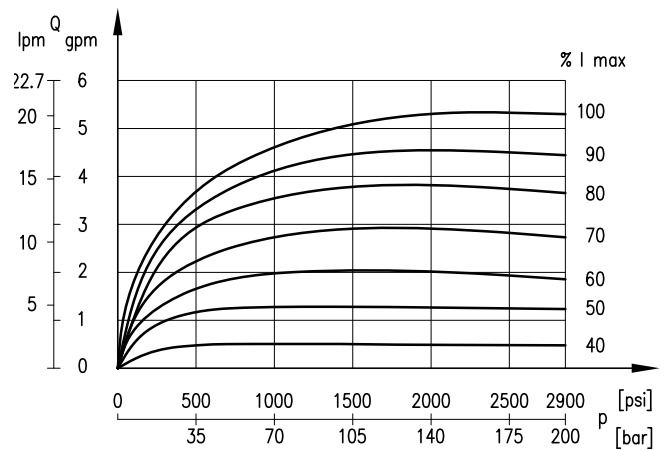


AC-08

FLOW CHARACTERISTICS



OPERATING LIMITS

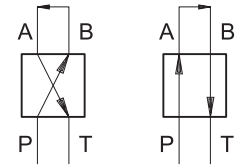


NOTES:

Curves obtained with VED03HL 24V version.

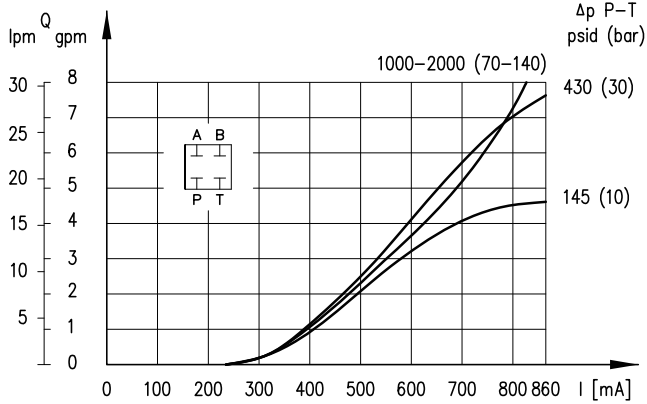
PERFORMANCE CURVES FOR AC SPOOL

Curves obtained with mineral oil viscosity of 170 sus (36 cSt) at 122°F (50°C); the Δp values are measured between P and T (full loop) valve ports.

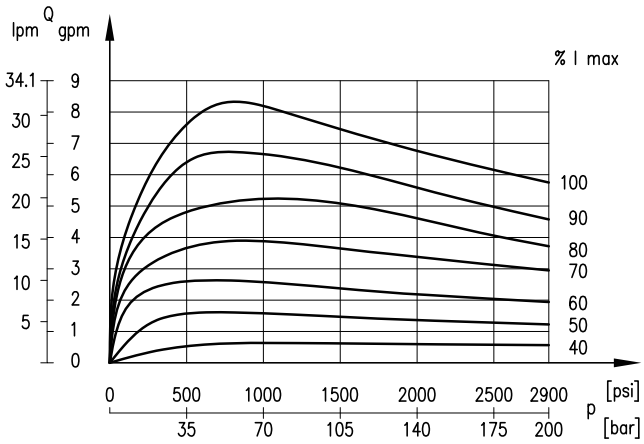


AC-16

FLOW CHARACTERISTICS

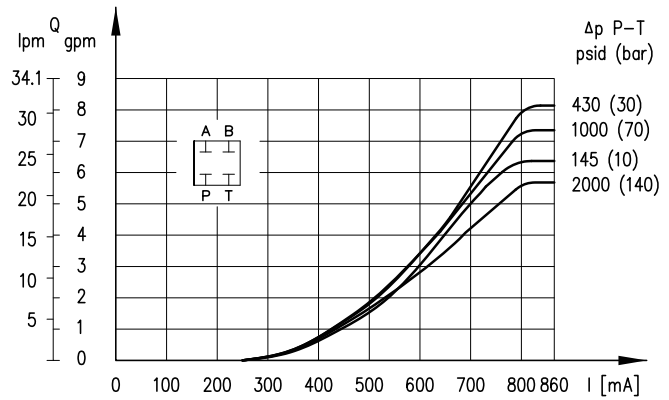


OPERATING LIMITS

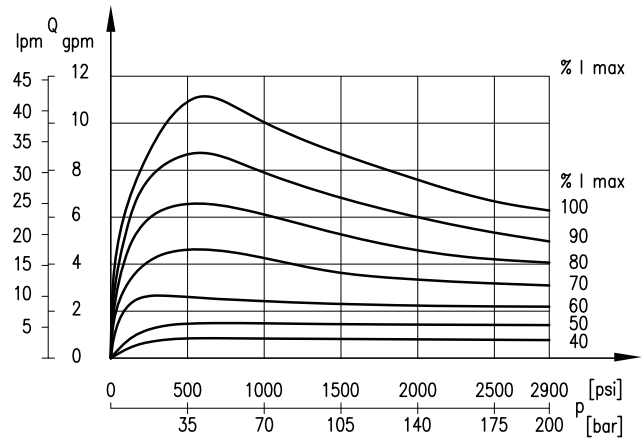


AC-26

FLOW CHARACTERISTICS



OPERATING LIMITS



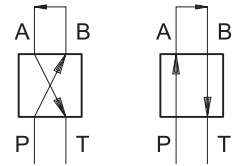
NOTES:

Curves obtained with VED03HL 24V version.

VED*HL*KO2 - HAZARDOUS LOCATION, PROPORTIONAL, DIRECT & PILOT OPERATED VALVES

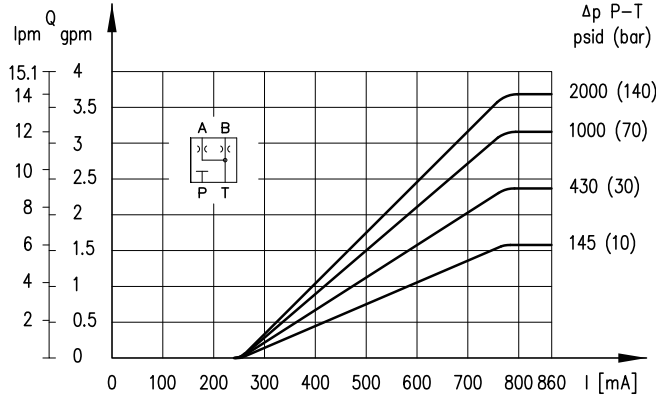
PERFORMANCE CURVES FOR FC SPOOL

Curves obtained with mineral oil viscosity of 170 sus (36 cSt) at 122°F (50°C); the Δp values are measured between P and T (full loop) valve ports.



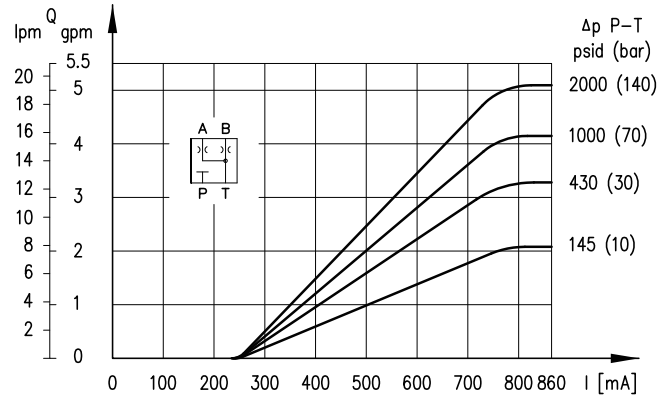
FC-04

FLOW CHARACTERISTICS

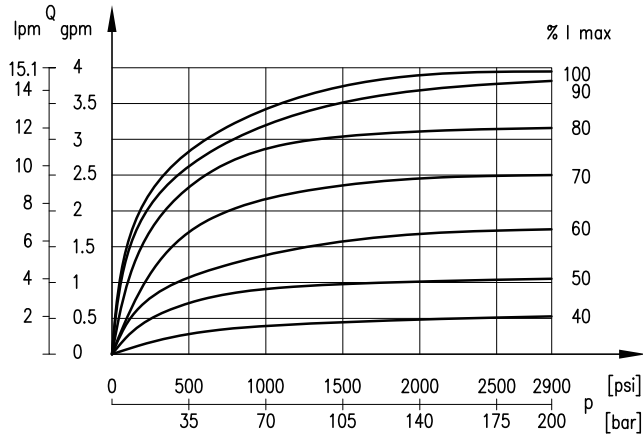


FC-08

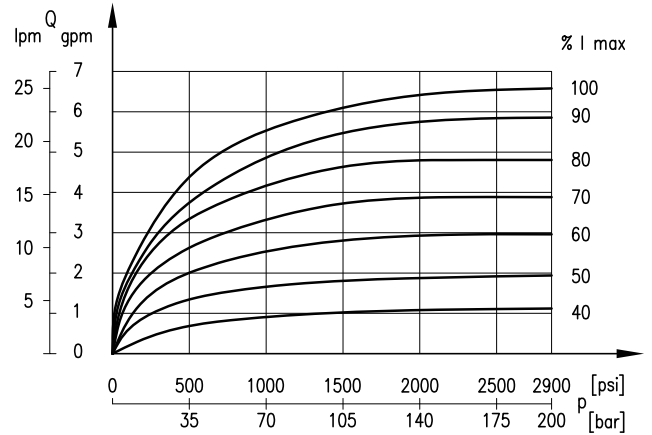
FLOW CHARACTERISTICS



OPERATING LIMITS



OPERATING LIMITS

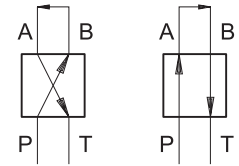


NOTES:

Curves obtained with VED03HL 24V version.

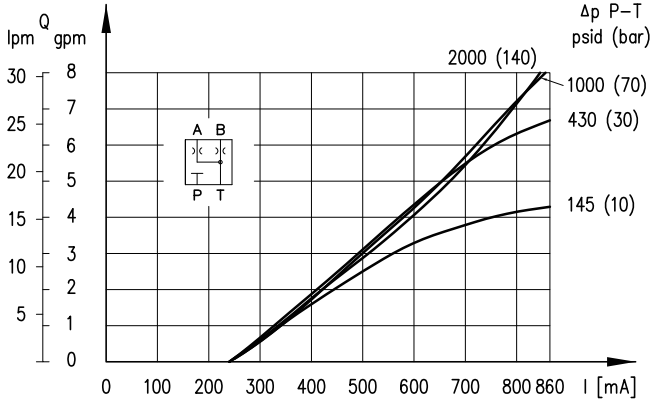
PERFORMANCE CURVES FOR FC SPOOL

Curves obtained with mineral oil viscosity of 170 sus (36 cSt) at 122°F (50°C); the Δp values are measured between P and T (full loop) valve ports.

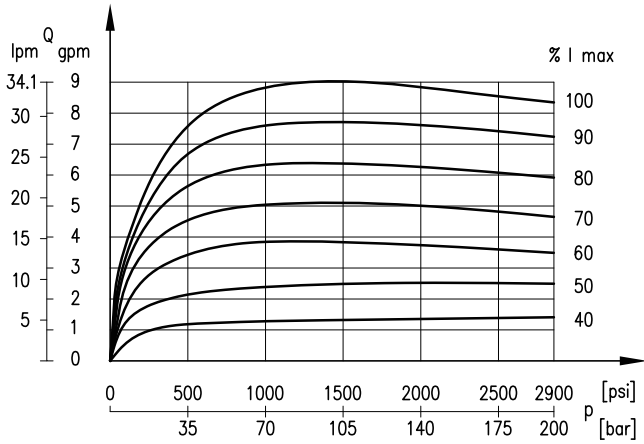


FC-16

FLOW CHARACTERISTICS

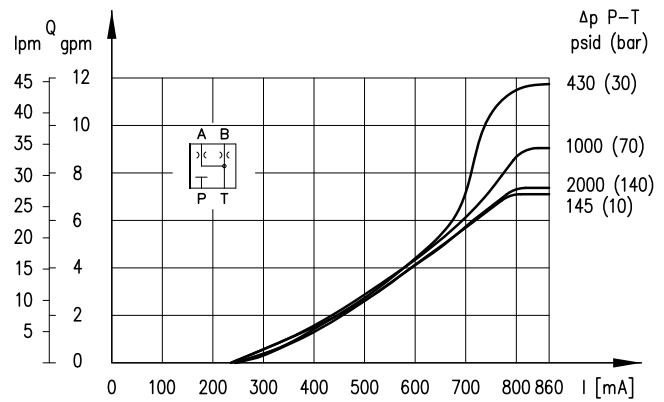


OPERATING LIMITS

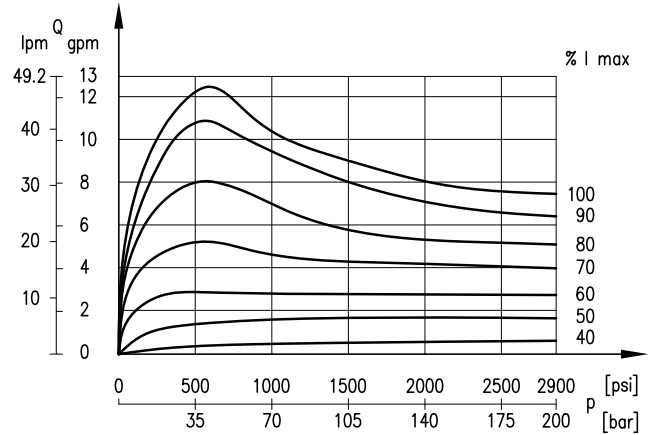


FC-26

FLOW CHARACTERISTICS



OPERATING LIMITS



NOTES:

Curves obtained with VED03HL 24V version.

RESPONSE TIME

VED03HL	ENERGIZING	DE-ENERGIZING
	0→100%	100%→0
TIME [ms]	50	40

VED*HL* K02 - HAZARDOUS LOCATION, PROPORTIONAL, DIRECT & PILOT OPERATED VALVES

OVERALL AND MOUNTING DIMENSIONS

THREAD OF MOUNTING HOLE

10-24 UNC-2B - 0.50

FASTENING

4 bolts - 10-24 UNC-3A X 1 1/4

TIGHTENING TORQUE

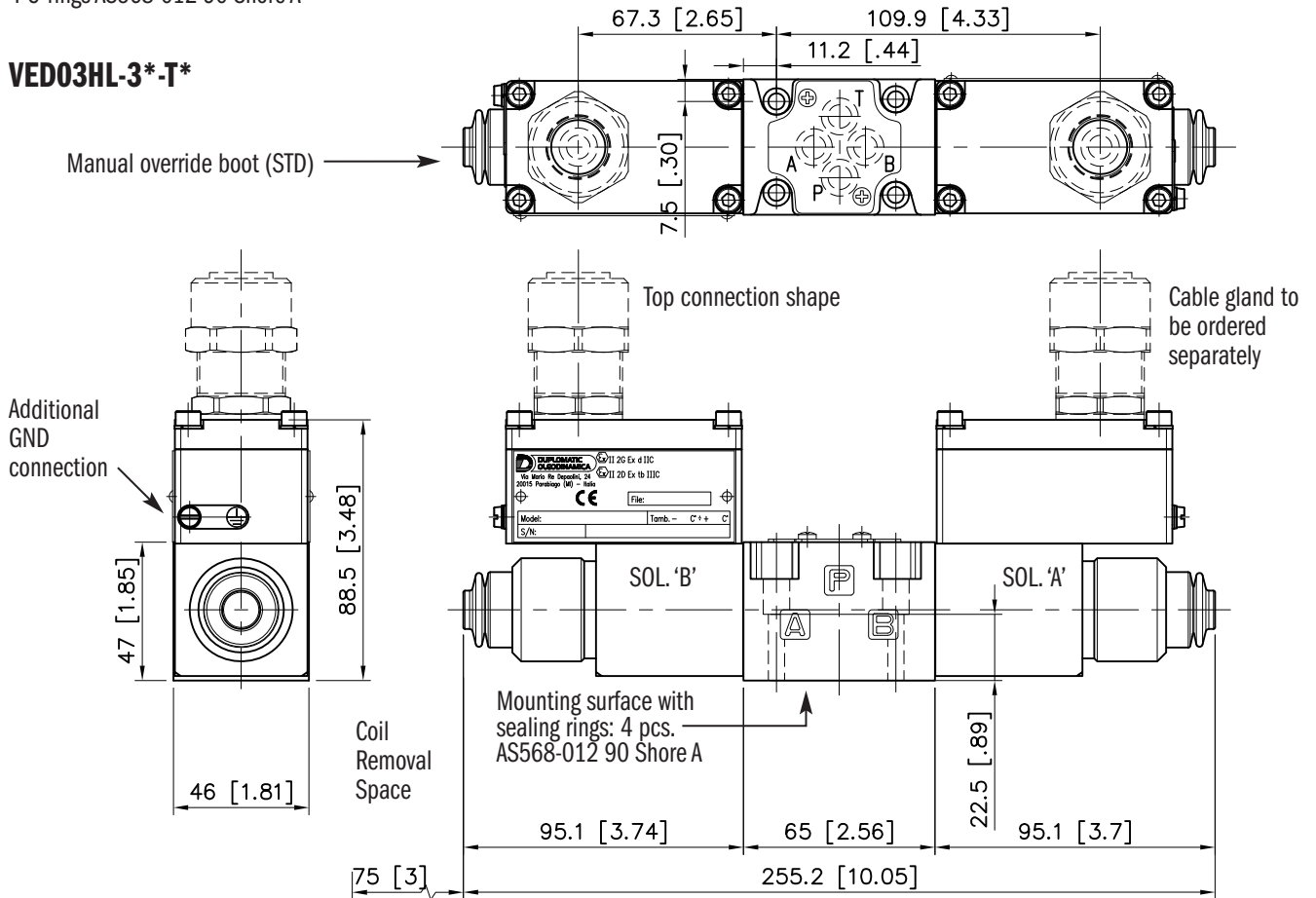
4-5 lbf-ft (5.5-6.8 Nm)

SEALING RINGS

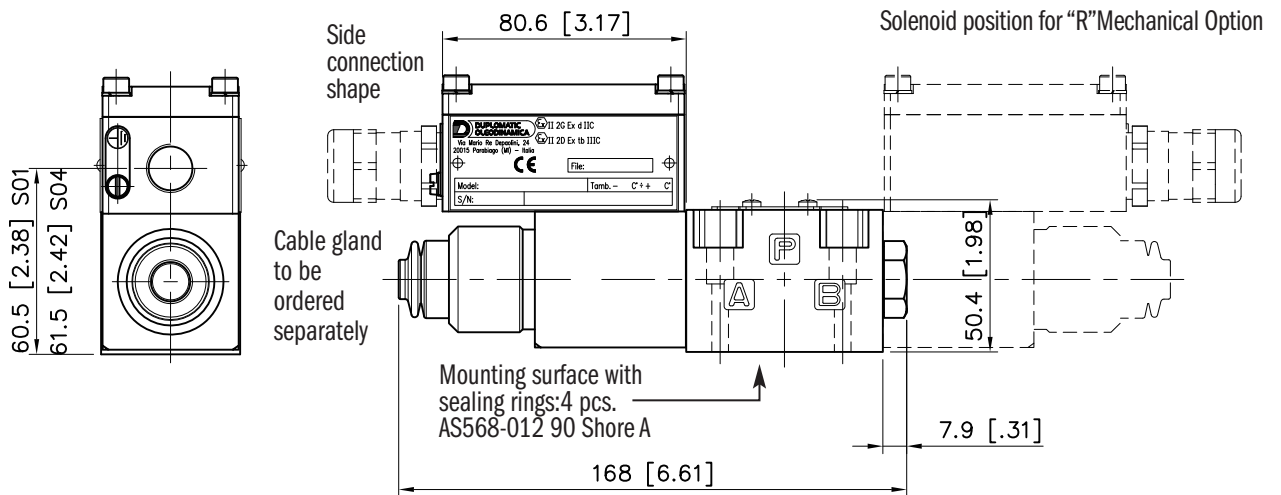
4 O-rings AS568-012 90 Shore A

Dimensions in mm [IN]

VED03HL-3*-T*



VED03HL-5*-S*



IDENTIFICATION CODE - HAZARDOUS LOCATION - PILOT OPERATED

VED **HL** - - - **- KD2** - **D** - — DESIGN LETTER

HAZARDOUS LOCATION

SIZE	
05A	NFPA D05 alt. A
05B	NFPA D05 alt. B
07	NFPA D07
08	NFPA D08
10	NFPA D10

VALVE ATEX APPROVAL
For gases, vapors, mists: EX II 2G IIC T4 Gb
For dust: EX II 2D IICT 154°C Db
(protection type of the coil "d")

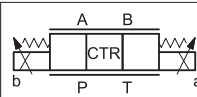
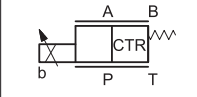
SOLENOIDS
see codes on page 20

SEAL	
A	Buna (STD)
G	Viton
AL	Buna (low temp)

MECHANICAL OPTIONS OMIT IF NOT REQUIRED	
R	Reverse Mode Sol. A supplied
F	Blind Retainer (STD for AL seal) see page 16

INTERNAL PILOT OPTIONS	
Z	PILOT PRESSURE REDUCER Mandatory with pilot drain 1 and 3 when pressure is higher than 3000 psi (210 bar)

TEMPERATURE CLASS	
OMIT	T4 (STD)
T5	T5 class (see page 20)

FUNCTION	
3	 <p>Dual Solenoid 3 Position Spring Centered</p>
5	 <p>Single operator 2 Position Spring Centered</p>

NOMINAL FLOW (with Δp P-T 145 psi)		
05	80	80 l/min (21 gpm)
	80/40	Asymmetrical spool: 80 l/min (21 gpm) on P-A 40 l/min (10.5 gpm) on B-T
07	100	100 l/min (26.5 gpm)
	150	150 l/min (40 gpm)
08	150/75	Asymmetrical spool: 150 l/min (40 gpm) on P-A 75 l/min (20 gpm) on B-T
	200	200 l/min (53 gpm)
10	300	300 l/min (80 gpm)
	300/150	Asymmetrical spool: 300 l/min (80 gpm) on P-A 150 l/min (40 gpm) on B-T
	350	350 l/min (93 gpm)
	500	500 l/min (132 gpm)
10	500/250	Asymmetrical spool: 500 l/min (132 gpm) on P-A 250 l/min (66 gpm) on B-T

PILOT / DRAIN	
1	Internal Pilot External Drain
2	External Pilot External Drain
3	Internal Pilot Internal Drain
4	External Pilot Internal Drain

TERMINAL BLOCK CONNECT	
T01	TOP: M20 x 1.5 ISO 261
T02	TOP: Gk 1/2 UNI EN 10226-2
T03	TOP: 1/2" NPT ANSI B1.20.1 (ex ANSI B 2.1)
S01	SIDE: M20 x 1.5 ISO 261 (available upon request only)
S04	SIDE: M16 x 1.5 ISO 261 (only for 24V)

TYPICAL ORDERING CODE:
VED07HL-3AC-150-A2T03-KD2-24D-A

NOTE:
The valve is supplied with STD surface treatment of phosphating black for the main body and Zinc-Nickel for the D03 pilot valve.

SPOOLS					
NAME	SYMBOL	DESCRIPTION	APPLICATION	SIZE	FUNCTION MATCHING
AC		METER IN / METER OUT	MOTION CONTROL	05#, 07, 08, 10	3, 5
FC					
RL		METER IN / METER OUT (REGEN)		07, 08, 10	3
RA					

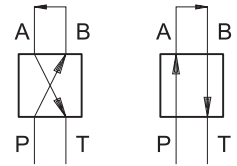
VED*HL* - KD2 - HAZARDOUS LOCATION, PROPORTIONAL, DIRECT & PILOT OPERATED VALVES

PERFORMANCE CURVES - FLOW GAIN

1. Curves obtained with mineral oil viscosity of 170 sus (36 cSt) at 122°F (50°C) and VED*HL at 24V with external amplifier.

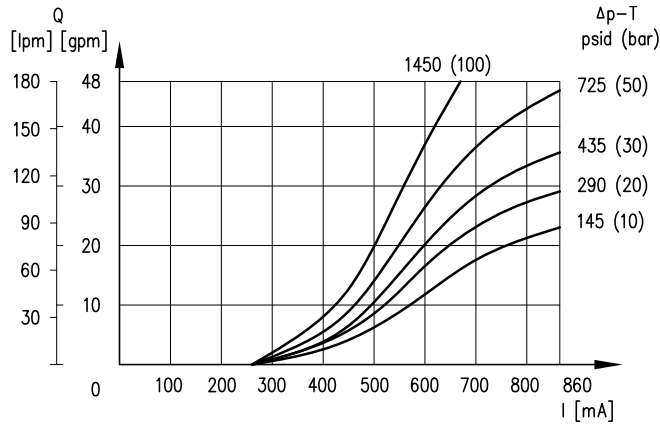
2. The Δp values are measured between P and T (full loop) valve ports.

3. Typical flow rate curves at constant Δp related to the reference signal and measured for the available spools.



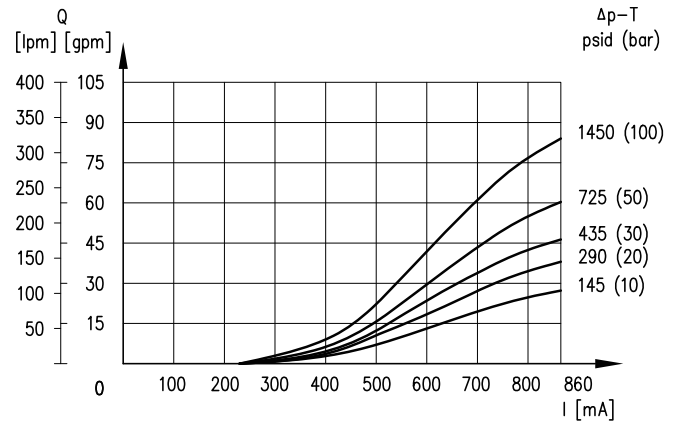
VED05*HL

AC-80/FC-80

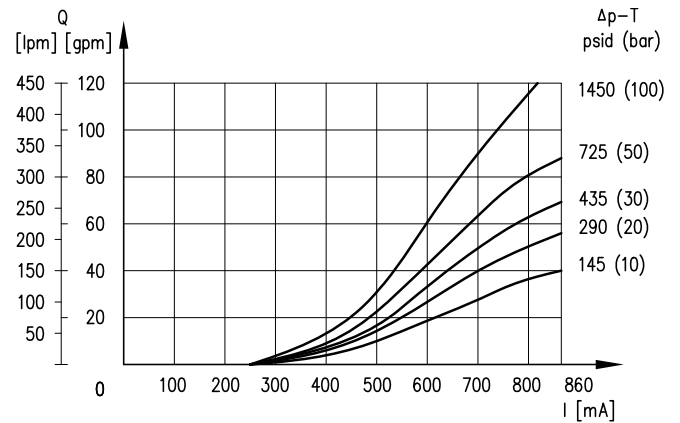


VED07HL

AC-100/FC-100



AC-150/FC-150



RESPONSE TIME

VED05*HL	ENERGIZING	DE-ENERGIZING
	0→100%	100%→0
TIME [ms]	50	40

RESPONSE TIME

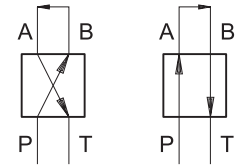
VED07HL	ENERGIZING	DE-ENERGIZING
	0→100%	100%→0
TIME [ms]	80	50

PERFORMANCE CURVES - FLOW GAIN

1. Curves obtained with mineral oil viscosity of 170 sus (36 cSt) at 122°F (50°C) and VED*HL at 24V with external amplifier.

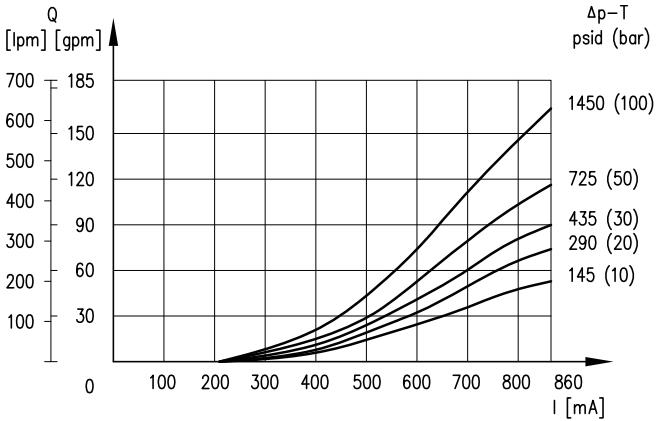
2. The Δp values are measured between P and T (full loop) valve ports.

3. Typical flow rate curves at constant Δp related to the reference signal and measured for the available spools.



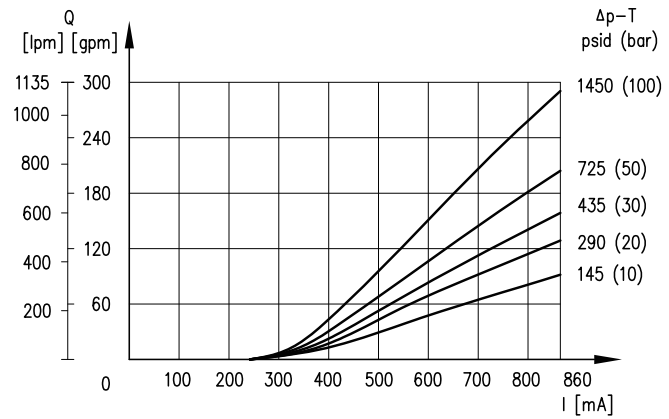
VED08HL

AC-200/FC-200

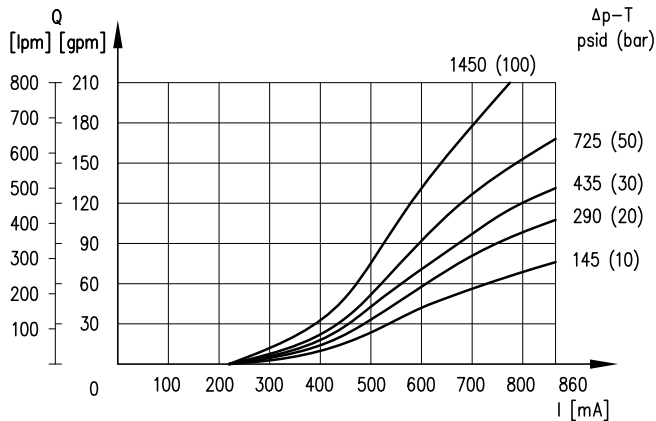


VED10HL

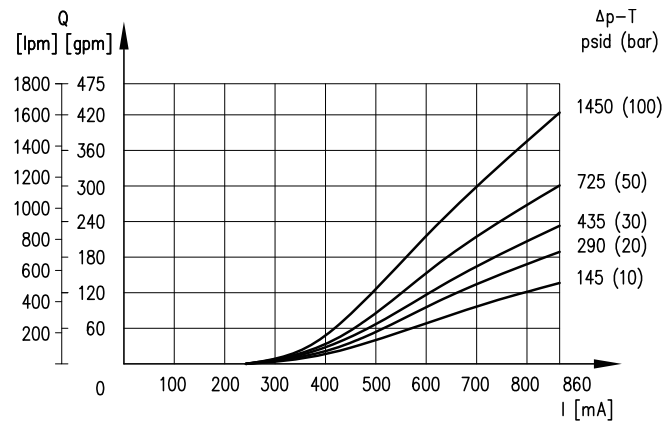
AC-350/FC-350



AC-300/FC-300



AC-500/FC-500



RESPONSE TIME

VED08HL	ENERGIZING	DE-ENERGIZING
	0→100%	100%→0
TIME [ms]	100	70

RESPONSE TIME

VED10HL	ENERGIZING	DE-ENERGIZING
	0→100%	100%→0
TIME [ms]	200	120

OVERALL AND MOUNTING DIMENSIONS FOR VED05*HL

Dimensions in mm [IN]

THREAD OF MOUNTING HOLE

1/4 - 20 UNC-2B x 0.60

FASTENING

4 bolts - 1/4 - 20 UNC-3A X 1 1/2

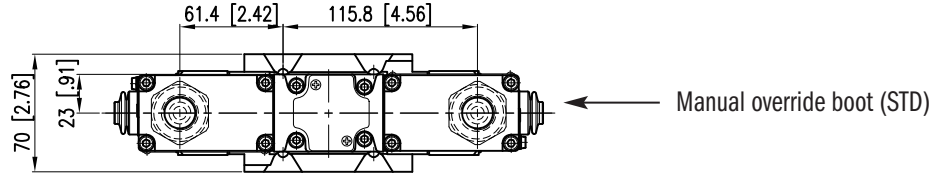
TIGHTENING TORQUE

6 lbf-ft (8 Nm)

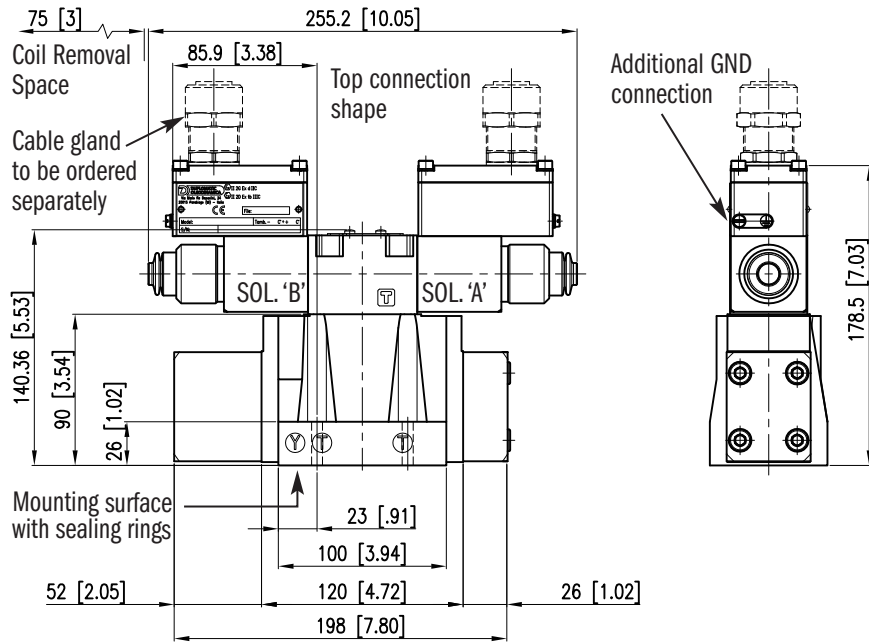
SEALING RINGS

5 O-rings AS568-014 90 Shore A

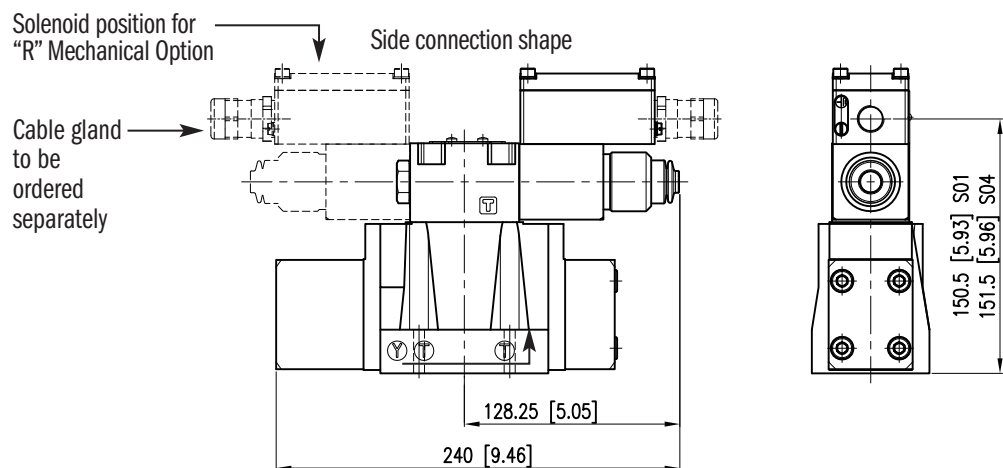
2 O-rings AS568-012 90 Shore A



VED05*HL-3*-*T*



VED05*HL-5*-*S*



OVERALL AND MOUNTING DIMENSIONS FOR VED07HL

THREAD OF MOUNTING HOLE

1/4 - 20 UNC-2B x 0.60

3/8 - 16 UNC-2B x 0.90

FASTENING

2 bolts - 1/4 - 20 UNC-3A X 2

Grade 8 or stronger

4 bolts - 3/8 - 16 UNC-3A X 2 1/2

Grade 8 or stronger

TIGHTENING TORQUE

1/4 - 20 UNC-2B: 6 lbf-ft (8 Nm)

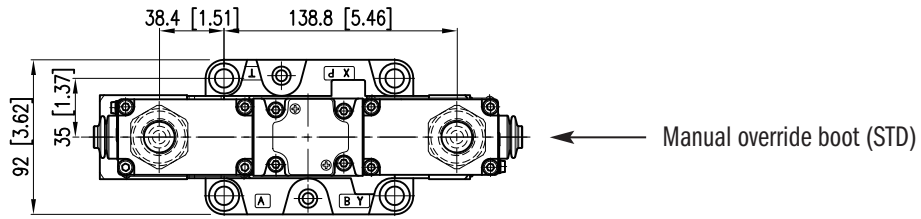
3/8 - 16 UNC-2B: 30 lbf-ft (40 Nm)

SEALING RINGS

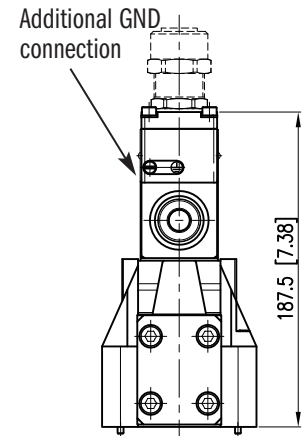
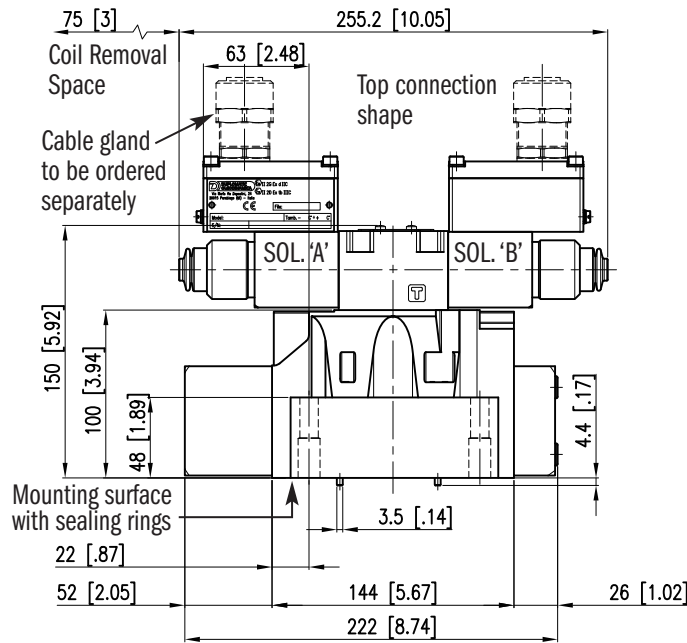
4 O-rings A5568-130 90 Shore A

2 O-rings AS568-013 90 Shore A

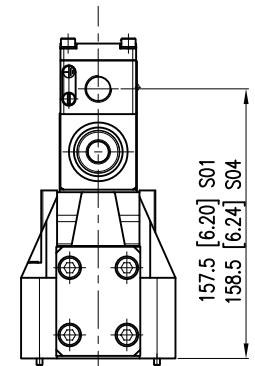
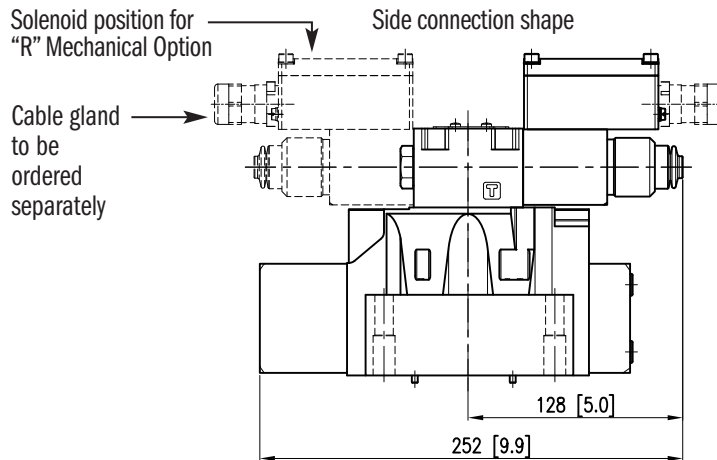
Dimensions in mm [IN]



VED07HL-3*-*T*



VED07HL-5*-*S*



VED*HL*-*K02* - HAZARDOUS LOCATION, PROPORTIONAL, DIRECT & PILOT OPERATED VALVES

OVERALL AND MOUNTING DIMENSIONS FOR VED08HL

Dimensions in mm [IN]

THREAD OF MOUNTING HOLE

1/2 - 13 UNC-2B x 0.90

FASTENING

6 bolts - 1/2 - 20 UNC-3A X 2 1/2

Grade 8 or stronger

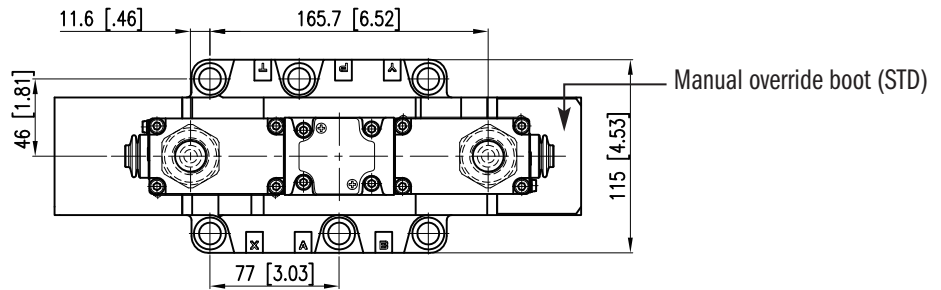
TIGHTENING TORQUE

51 lbf-ft (69 Nm)

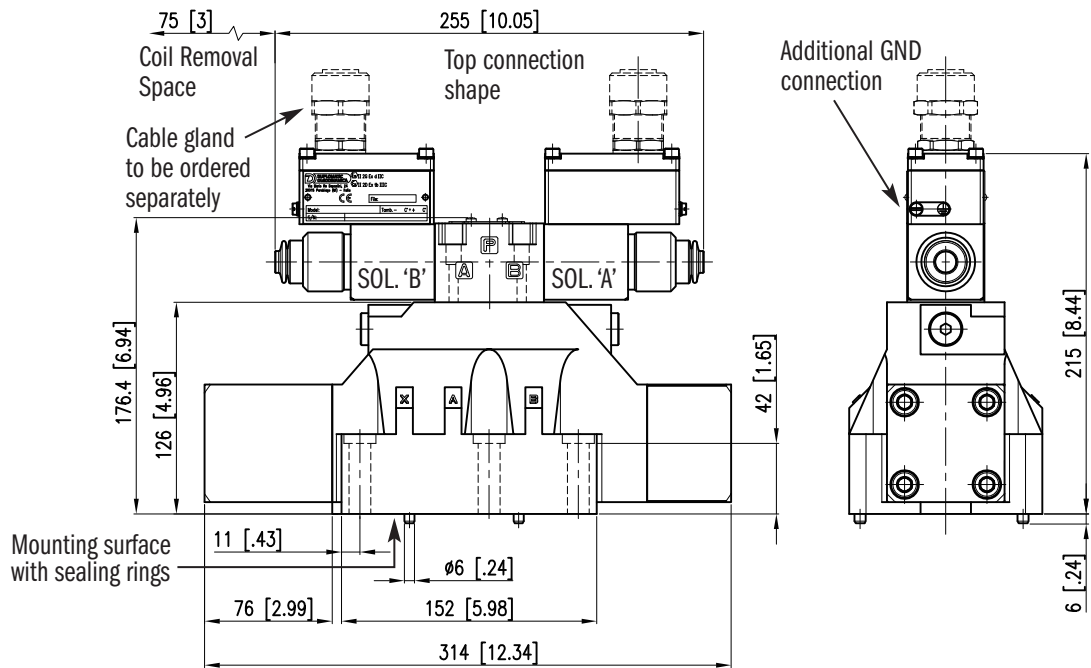
SEALING RINGS

4 O-rings AS568-123 90 Shore A

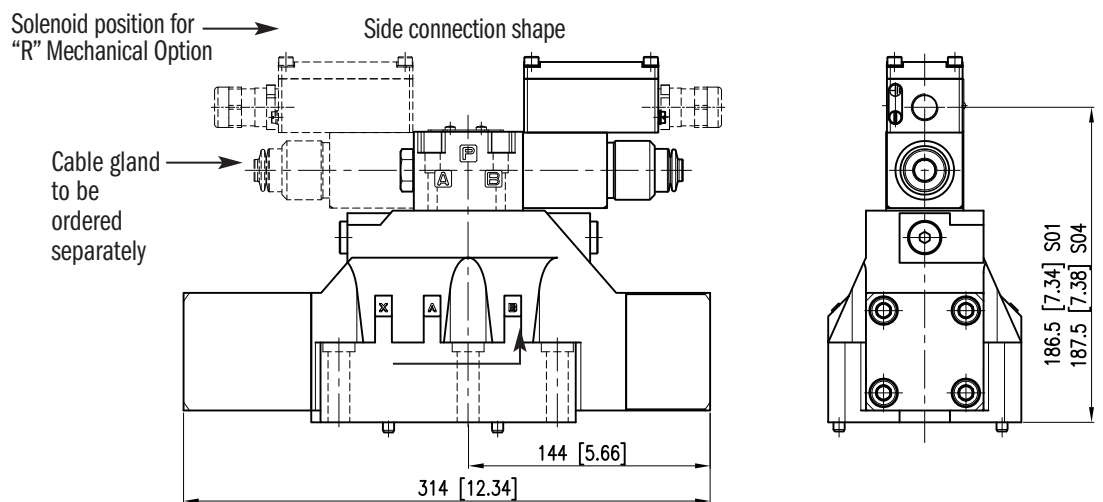
2 O-rings AS568-117 90 Shore A



VED08HL-3*-*T*



VED08HL-5*-*S*



OVERALL AND MOUNTING DIMENSIONS FOR VED10HL

Dimensions in mm [IN]

THREAD OF MOUNTING HOLE

3/4 - 10 UNC-2B x 1.60

FASTENING

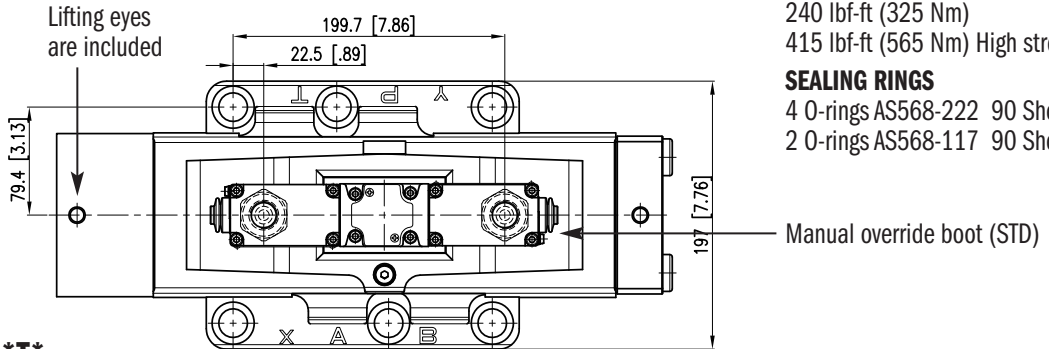
6 bolts - 3/4 - 20 UNC-3A X 2 3/4
Grade 8 or stronger or higher strength

TIGHTENING TORQUE

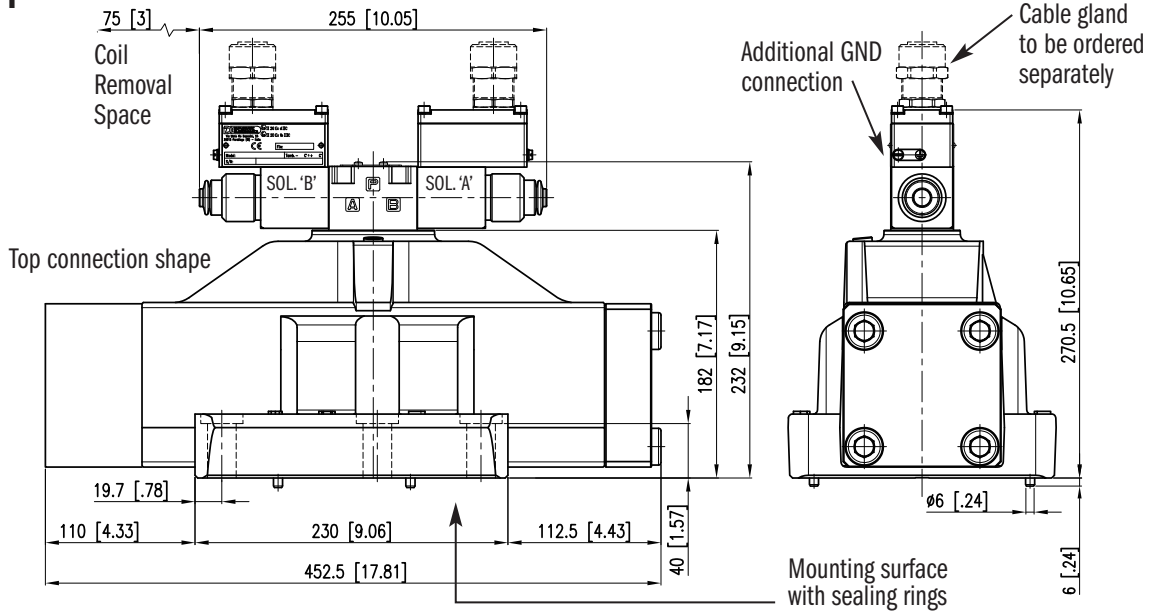
240 lbf-ft (325 Nm)
415 lbf-ft (565 Nm) High strength

SEALING RINGS

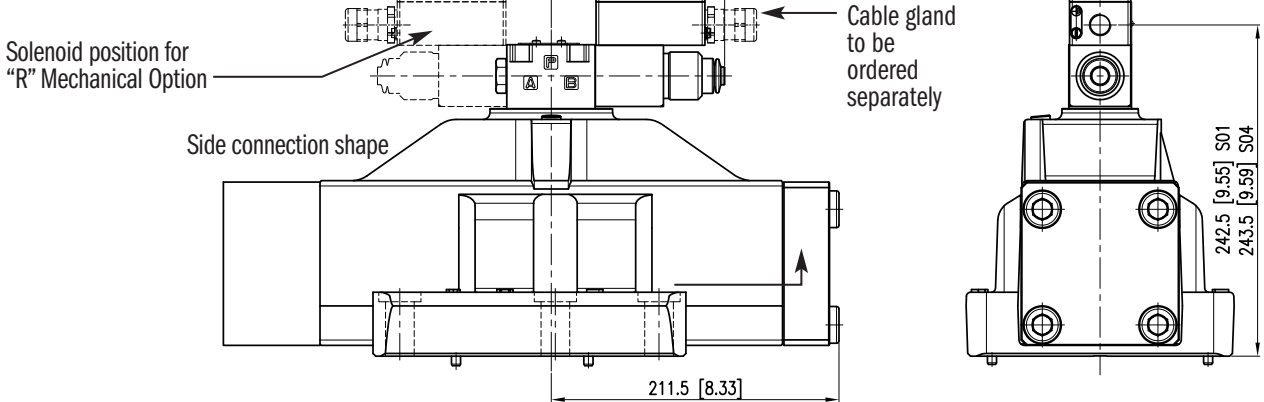
4 O-rings AS568-222 90 Shore A
2 O-rings AS568-117 90 Shore A



VED10HL-3*-.T*



VED10HL-5*-.S*

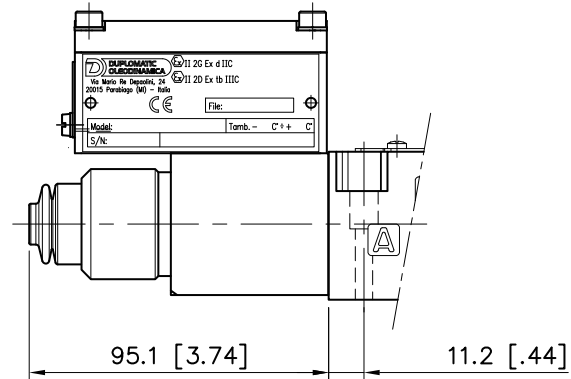


VED*HL* - KD2 - HAZARDOUS LOCATION, PROPORTIONAL, DIRECT & PILOT OPERATED VALVES

MECHANICAL OPTIONS

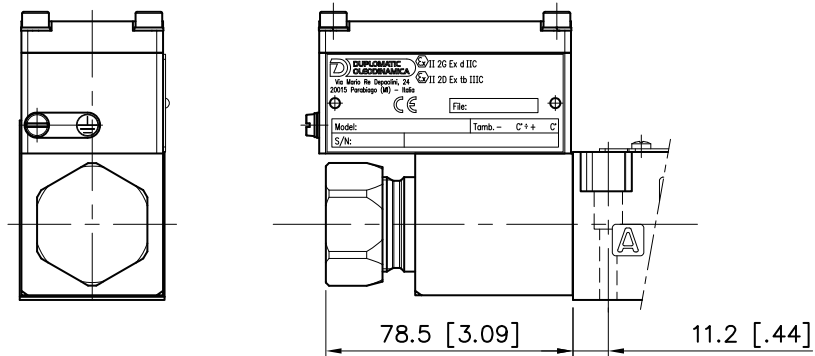
MANUAL OVERRIDE BOOT

The manual override boot is standard on valves with seal codes A and G. It is not available with seal code AL (low temp).



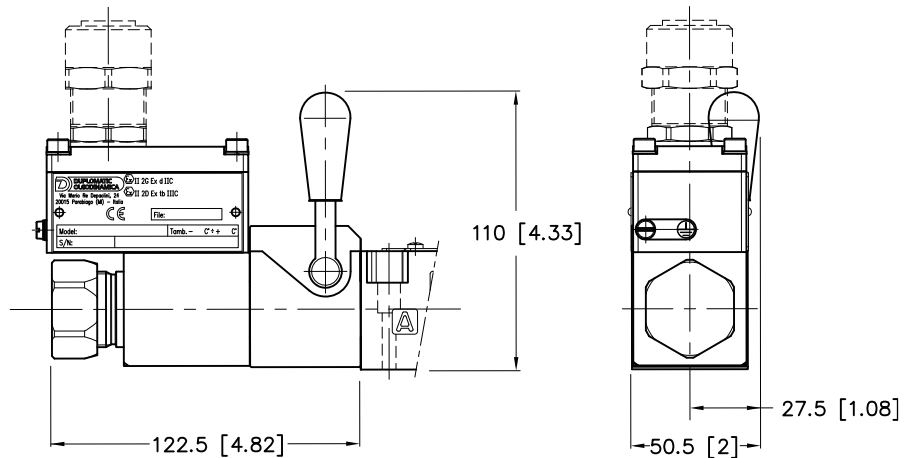
BLIND RETAINER (CODE F)

The blind retainer is standard on valves with seal code AL. It is available as an option with seal code A and G.



LEVER MANUAL OVERRIDE (CODE H)

This device can be installed either on single or dual solenoid valves, on port end A only. Option available just on direct operated VED03HL valve.



PILOTING AND DRAINAGE

The VED*HL valves are available with piloting and drainage, both internal and/or external.

The version with internal pilot without pressure reducer is suitable only on systems where the pressure is not higher than 3000 psi (210 bar).

When the system pressure exceeds 3000 psi (210 bar) the use of the version with external pilot is mandatory, or alternatively, the version with internal pilot and pressure reducer. The pressure reducer has fixed adjustment of 430 psi (30 bar).

The version with external drainage allows a higher back pressure on the unloading.

CODE	PILOT	X PLUG	DRAIN	Y PLUG
1	Internal	□	External	■
2	External	■	External	■
3	Internal	□	Internal	□
4	External	■	Internal	□

■ Plugged □ Unplugged

PILOTING AND DRAINAGE

Minimum value of piloting pressure on port X: 430 psi (30 bar).

PILOTING FLOW REQUIRED WITH OPERATION 0 → 100%		
VED05*HL	0.79 gpm	3 lpm
VED07HL	1.32 gpm	5 lpm
VED08HL	2.38 gpm	9 lpm
VED10HL	3.43 gpm	13 lpm

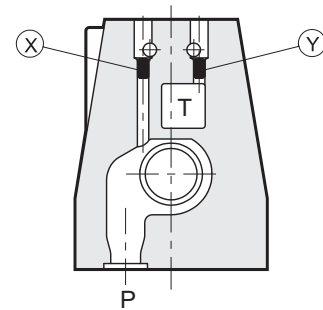
PILOTING VOLUME REQUIRED WITH OPERATION 0 → 100%		
VED05*HL	0.10 in ³	1.7 cm ³
VED07HL	0.19 in ³	3.2 cm ³
VED08HL	0.55 in ³	9.1 cm ³
VED10HL	1.32 in ³	21.6 cm ³

PLUG SIZE

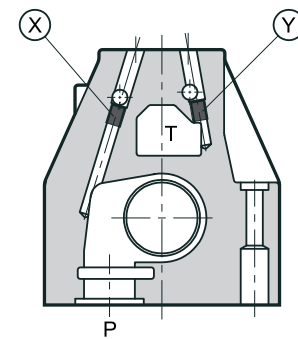
VED05*HL	M5x6 mm
VED07HL	M6x8 mm
VED08HL	M6x8 mm
VED10HL	M6x8 mm

PLUG MOUNTING

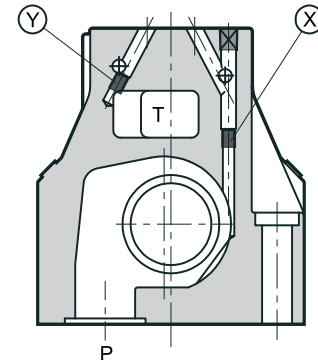
VED05*HL



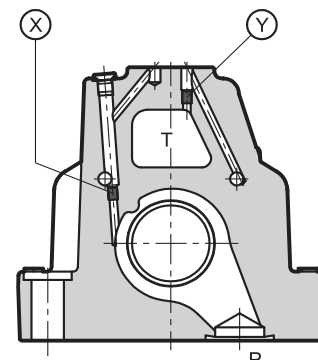
VED07HL



VED08HL



VED10HL



INTERNAL PILOT OPTIONS

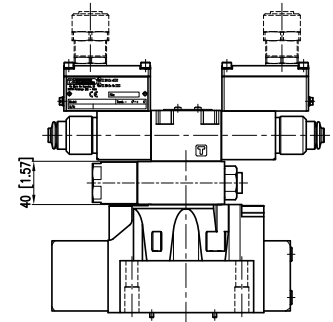
PRESSURE REDUCING (Z)

THE PRESSURE REDUCING MODULE IS DESIGNED TO PROTECT THE VALVE FROM PILOT PRESSURES EXCEEDING 3000 PSI (210 BAR).

When the system pressure exceeds 3000 psi (210 bar) the use of the version with external pilot is mandatory, or alternatively, the version with optional Z internal pilot.

The pressure reducer has fixed adjustment of 430 psi (30 bar).

To request this option add the letter "Z" into the internal pilot option box, in the identification code.



HAZARDOUS LOCATION

Continental Hydraulics certified the valve/coil combination which are suitable for application and installation in potentially explosive atmospheres according to ATEX directives. **The product always includes the declaration of conformity to the directive and the operating and maintenance manual, which includes all the information needed to properly apply the valve in potentially explosive environments.** Coils assembled on these valves are separately certified according to ATEX directive and are suitable for use in potentially explosive atmospheres.

VALVE ATEX CLASSIFICATION

The valves can be used for applications and installations in potentially explosive atmospheres that fall within either the ATEX II 2G or the ATEX II 2D classification, with the following markings:

MARKING FOR GASES, VAPOURS & MISTS

 II 2G IIC T4 Gb (-20°C Ta +80°C) for both A and G seals

 II 2G IIC T4 Gb (-40°C Ta +80°C) for AL seals

EX: Specific marking of explosion protection as ATEX 94/9/EC directive and related technical specification requests.

II: Group II for surface plants

2: Category 2 high protection, eligible for zone 1 (therefore also eligible for category 3 zone 2)

G: Type of atmosphere with gases, vapours and mists

IIC: Gas group (therefore also eligible for group IIA and IIB)

T4: Temperature class (max surface temperature)

Gb: EPL protection level for electrical devices

-20°C Ta +80°C: Ambient temperature range for valves with both A and G seals.

-40°C Ta +80°C: Ambient temperature range for valves with AL seals

MARKING FOR DUSTS

 II 2D IIIC T154°C Db IP66/IP68 (-20°C Ta +80°C) for both A and G seals

 II 2D IIIC T154°C Db IP66/IP68 (-40°C Ta +80°C) for AL seals

EX: Specific marking of explosion protection as ATEX 94/9/EC directive and related technical specification requests.

II: Group II for surface plants

2: Category 2 high protection, eligible for zone 21 (therefore also eligible for category 3 zone 22)

D: Type of atmosphere with dusts

IIIC: Dust group (therefore also eligible for group IIIA and IIIB)

T154°C: Temperature class (max surface temperature)

Db: EPL protection level for electrical devices

IP66/IP68: Protection degree from atmospheric agents according to IEC EN 60529

-20°C Ta +80°C: Ambient temperature range for valves with both A and G seals.

-40°C Ta +80°C: Ambient temperature range for valves with AL seals

COIL ATEX CLASSIFICATION

The coil of the explosion-proof valves is identified with its own tag, which carries the relative ATEX marking. **The mechanical construction of the coil housing is made in order to ensure its resistance to possible internal explosion and to avoid any explosion propagation to the outside environment, matching an "Ex d" type protection (explosion-proof coil).**

Moreover, the solenoid is designed to maintain its surface temperature below the limits specified to the relevant class.

Here below you find the coils marking:

MARKING FOR GASES, VAPOURS & MISTS

 II 2G Ex d IIC T4 Gb (-40°C Ta +80°C)

EX: Specific marking of explosion protection as ATEX 94/9/EC directive and related technical specification requests.

II: Group II for surface plants

2: Category 2 high protection, eligible for zone 1 (therefore also eligible for category 3 zone 2)

G: Type of atmosphere with gases, vapours and mists

Ex d: "d" protection type, explosion-proof case

IIC: Gas Group (therefore also eligible for group IIA and IIB)

T4: Temperature class (max surface temperature)

Gb: EPL protection level for electrical devices

-40°C Ta +80°C: Ambient temperature range

MARKING FOR DUSTS

 II 2D Ex tb IIIC T154°C Db IP66/IP68 (-40°C Ta +80°C)

EX: Specific marking of explosion protection as ATEX 94/9/EC directive and related technical specification requests.

II: Group II for surface plants

2: Category 2 high protection, eligible for zone 21 (therefore also eligible for category 3 zone 22)

D: Type of atmosphere with dusts

Ex tb: "tb" protection type

IIIC: Dust groups (therefore also eligible for group IIA and IIB)

T154°C: Temperature class (max surface temperature)

Db: EPL protection level for electrical devices

IP66/IP68: Value IP degree

-40°C Ta +80°C: Ambient temperature range

OPERATING TEMPERATURE

The operating ambient temperature must be between -20°C [-4°F]/+80°C [+176°F] for valves with both A and G seals and -40°C [-40°F]/+80°C [+176°F] for valves with AL seals. The fluid temperature must be between -20°C [-4°F]/+80°C [+176°F] for valves with both A and G seals and -40°C [-40°F]/+80°C [+176°F] for valves with AL seals. The valves are classified in T4 temperature class (T154°C = 309°F), therefore they are eligible for operation also at higher class temperatures (T3, T2, T1 for gas and T200°C = 392°F for dust).

T5 OPTION: VERSION FOR T5 TEMPERATURE CLASS

The valves classified for T5 temperature class are suitable for operation in potentially explosive atmospheres with ambient temperatures between -20 °C [-4 °F] / +55 °C [+131 °F], for both valves with A and G seals and -40 °C [-40 °F] / +55 °C [+131 °F], for valves with AL seals. The fluid temperature must be between -20 °C [-4 °F] / +55 °C [+131 °F], for both valves with A and G seals and -40 °C [-40 °F] / +55 °C [+131 °F], for valves with AL seals. The valves are classified in T5 temperature class (T129 °C), therefore they are eligible for operation also at higher class temperature (T4, T3, T2, T1 for gas and T135 °C for dusts).

The marking for T5 class temperature versions are:

VALVE MARKING FOR GASES, VAPOURS & MISTS

Ex II 2G IIC T5 Gb (-20°C Ta +55°C) for both A & G seals

Ex II 2G IIC T5 Gb (-40°C Ta +55°C) for AL seals

COIL MARKING FOR GASES, VAPOURS, MISTS

Ex II 2G Ex d IIC T5 Gb (-40°C Ta +55°C)

VALVE MARKING FOR DUSTS

Ex II 2D IIIC T129°C Db IP66/IP68 (-20°C Ta +55°C) for both A & G seals

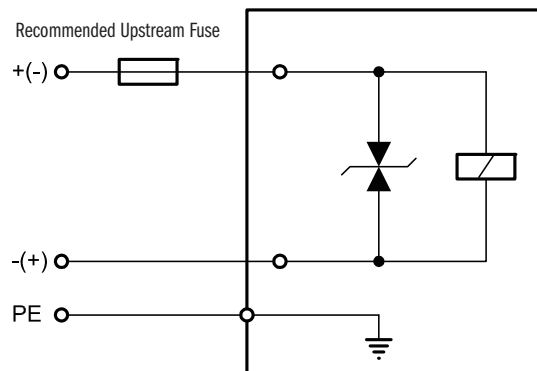
Ex II 2D IIIC T129°C Db IP66/IP68 (-40°C Ta +55°C) or AL seals

COIL MARKING FOR DUSTS

Ex II 2D Ex tb IIIC T129°C Db IP66/IP68 (-40°C Ta +55°C)

SOLENOIDS

Listed below the types of solenoids available and the numbers to be added in the solenoid box on page 3 or 9.



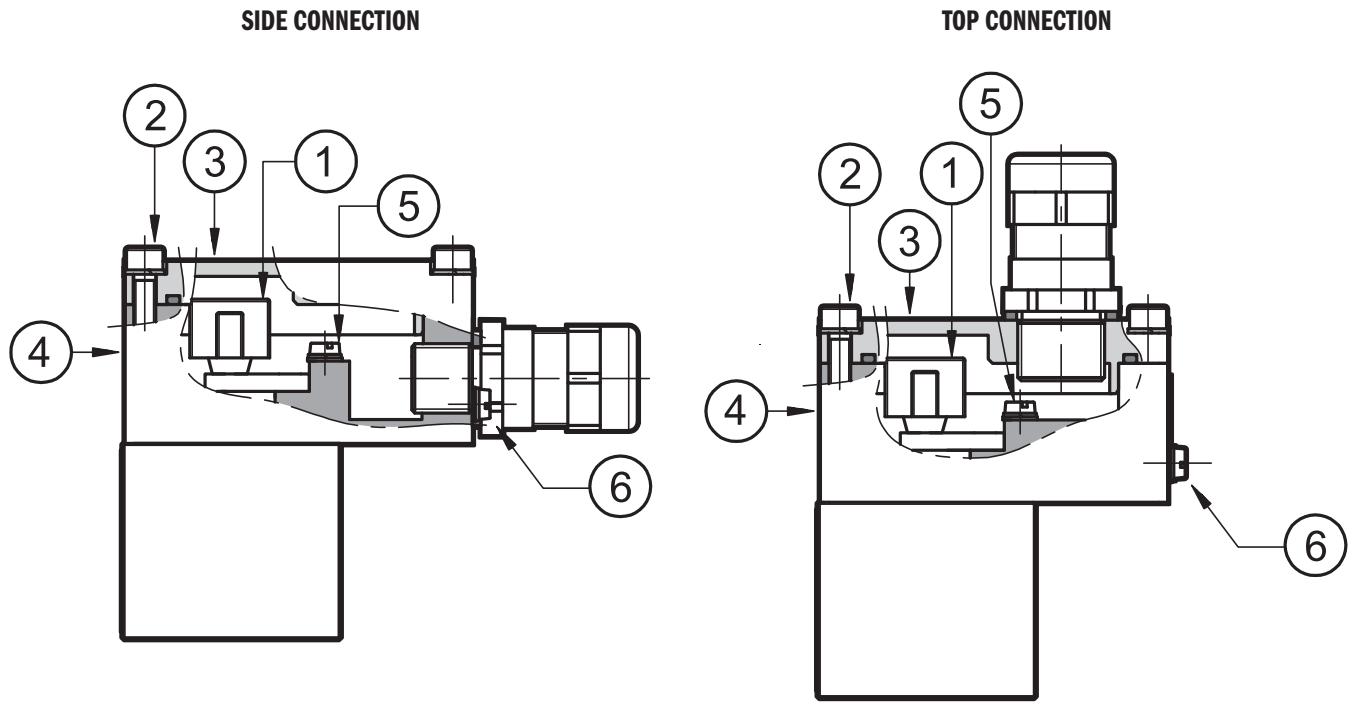
COIL CODE	RESISTENCE [OHM]	NOMINAL CURRENT [A]	PRE-FUSE [A]	MAX VOLTAGE UPON SWITCH OFF [V]
12	3.4	1.88	2.5	-49
24	15.6	0.86	1.25	-49

Upstream of each valve, an appropriate fuse (max 3 x I_n according to IEC 60127) or a protective motor switch with short-circuit and thermal instantaneous tripping, as short-circuit protection, must be connected. The cut-off power of the fuse must correspond or exceed the short-circuit current of the supply source. The fuse or protective motor must be placed outside the dangerous area or they must be protected with an explosion-proof covering.

In order to safeguard the electronic device to which the valve is connected, there is a protection circuit in the coil, that reduces voltage peaks, which can occur when inductances are switched off.

The chart above show the type of fuse recommended according to the nominal voltage of the valve and to the value of the voltage peaks reduction.

WIRING



You must gain access to the terminal block (1) to wire the valve. Remove the 4 cover screws (2) that secure the cover (3) to the box (4). Remove the cover.

The electrical connection is polarity-independent.

It is important to connect the grounding points (5) in the terminal box (M4 screws), through suitable conductors, to the general grounding line of the system. There is a grounding point (6) (M4 screws) on the external body of the coil to ensure the valve and general grounding line are equal in potential. Connecting this point to the general grounding line verifies that, per standard EN13463-1, the equipotentiality of the elements included in a potentially explosive environment is guaranteed.

Maximum allowable resistance between elements is 100 Ω.

After the electrical wiring is complete, reassemble the cover (3) on to the box (4), checking to be sure the seal is correctly positioned in the cover seat. Fasten the 4 M5 screws with a torque of 4.9-6 Nm [3.6-4.4 lb/ft].

Characteristics of the cables connectable for wiring are indicated in the table below:

FUNCTION	CABLE SECTION
Operating voltage cables connection	Max 2.5 mm ²
Connection for internal grounding point	Max 2.5 mm ²
Connection for external equipotential grounding point	Max 6.0 mm ²

Cables for wiring must be non-armoured cables, with external covering sheath and must be suitable for use in environments with temperatures from -20°C [-4°F] to +110°C [+230°F] (for valves either with A or G seals) or from -40°C [-40°F] to +110°C [+230°F] (for valves with AL seals).

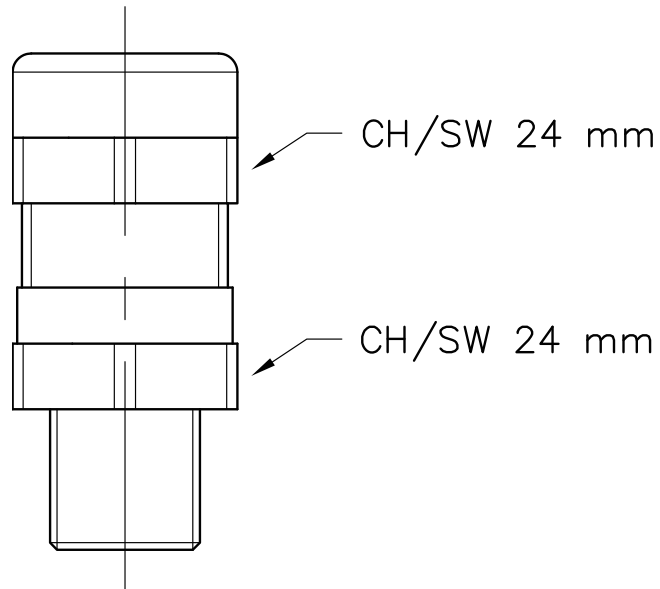
VED*HL*K02 - HAZARDOUS LOCATION, PROPORTIONAL, DIRECT & PILOT OPERATED VALVES

WIRING

CABLE GLANDS

Cable glands must be ordered separately; Continental Hydraulics offers some types of cable glands with the following features:

- Version for non-armoured cable, external seal on the cable (suitable for diameter 8 to 10 mm cables)
- According to ATEX II 2GD directive certified
- Cable gland material: Nickel and Brass
- Rubber tip material: Silicone
- Ambient temperature range: -70°C [-94°F] to +220°C [+428°F]
- Protection degree: IP66/IP68



DESCRIPTION	NOTES	CONNECTION TYPE	ITEM
CGK2/NB-01/10	M20 x 1.5 - ISO 261 Male Tread	T01 - S01	M3908108001
CGK2/NB-02/10	Version with Gk 1/2 - UNI EN 10226-2 Male Tread	T02	M3908108002
CGK2/NB-03/10	Version with 1/2" NPT - ANSI B1.20.1 (ex ANSI B2.1)	T03	M3908108003
CGK2/NB-04/10	Version with M16 x 1.5 - ISO 261 Male Thread	S03	M3908108004

NOTES:

CGK2/NB-01/10 & CGK2/NB-04/10

It is supplied equipped with silicone seal, that must be assembled between the cable gland and the coil cover, so as to ensure IP66/IP68 protection degree.

CGK2/NB-02/10 & CGK2/NB-03/10

In order to ensure IP66/IP68 protection degree, the customer must apply LOCTITE 243™ Threadlocker or similar between the cable gland connection thread and the coil cover.

MOUNTING SURFACES

ALL THE MOUNTING SURFACES REFER TO NFPA T3.5.1 R2-2002 AND ISO 4401:2005 STANDARDS.

The mounting surface standards recommends metric coarse threads. However, subplates are commercially available with UNC threads. Select a bolt size that matches the threads in the mounting surface.

Dimensional tolerances are ± 0.1 mm (0.004") for bolt and pin location; ± 0.2 mm (0.008") for the other quotes.

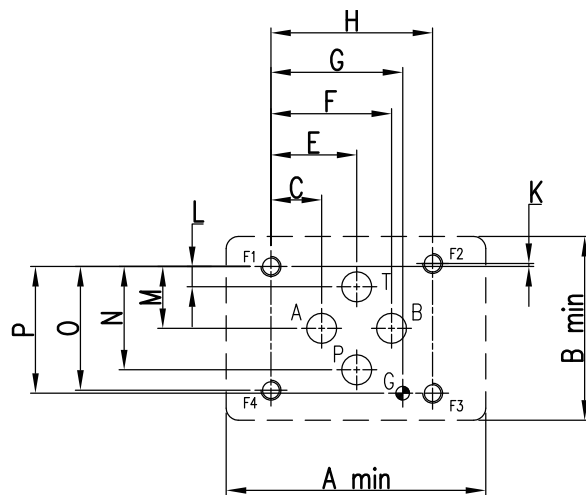
The minimum depth of the blind hole G where required is 8 mm (0.31 in).

D03

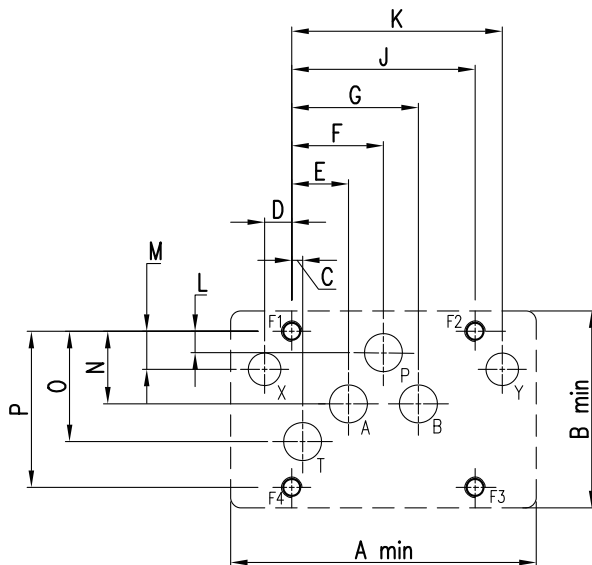
	MM	INCH
P, A, B, T MAX	$\varnothing 7.0$	$\varnothing 0.276$
G MAX	$\varnothing 4.0$	$\varnothing 0.16$
MOUNTING BOLT THREAD SIZE	M5	10-24 UNC 2B

	MM	INCH
A	51.0	2.00
B	43.0	1.70
C	12.7	0.50
E	21.5	0.85
F	30.2	1.19
G	33.0	1.30
H	40.5	1.594

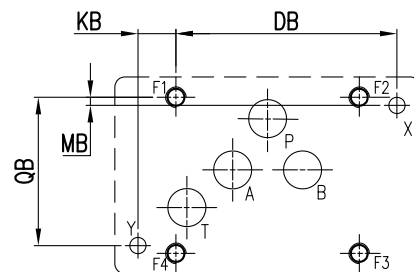
	MM	INCH
K	0.75	0.03
L	5.10	0.20
M	15.5	0.61
N	25.9	1.02
O	31.0	1.22
P	31.8	1.25



D05 - ALTERNATIVE A



D05 - ALTERNATIVE B



PORT FUNCTION:

P = PRESSURE PORT
T = TANK PORT

A = FIRST CYLINDER PORT
X = PILOT PORT

B = SECOND CYLINDER PORT
Y = DRAIN PORT

	MM	INCH
P, A, B, T MAX	∅ 11.2	∅ 0.44
X, Y ALT. A	∅ 6.30	∅ 0.25
X, Y ALT. B	∅ 4.80	∅ 0.19
MOUNTING BOLT THREAD SIZE	M6	1/4 - 20 UNC

	MM	INCH
A	90.0	3.54
B	58.0	2.28
C	3.20	0.126
D	8.00	0.31
E	16.7	0.66
F	27.0	1.06
G	37.3	1.47

	MM	INCH
J	54.0	2.125
K	62.0	2.44
L	6.30	0.25
M	11.2	0.44
N	21.4	0.84
O	32.5	1.28
P	46.0	1.812

	MM	INCH
DB	65.1	2.563
KB	11.2	0.44
MB	2.40	0.09
QB	43.7	1.72

NOTES:

NFPA D05 and ISO 4401-05 indicates different diameters for X and Y holes:

NFPA: ∅ 9.6 max in D05 alt A

∅ 4.8 max in D05 alt B

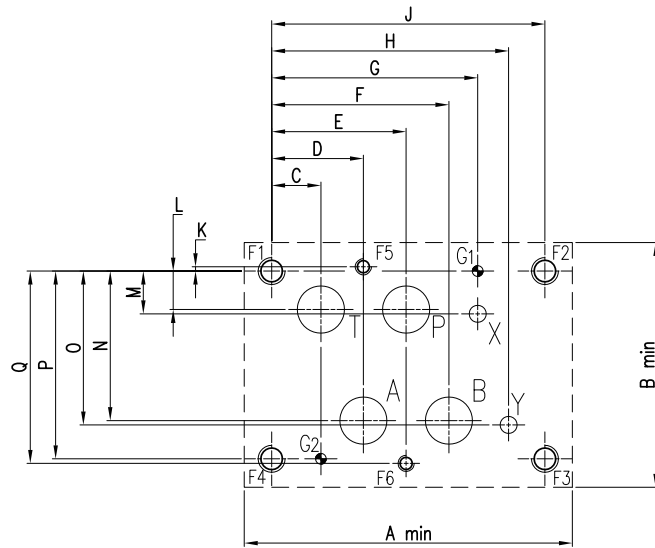
ISO: ∅ 6.3 max both

D07

	MM	INCH
P, A, B, T MAX	Ø 17.5	Ø 0.69
X, Y MAX	Ø 6.30	Ø 0.25
G MAX	Ø 4.00	Ø 0.16
MOUNTING BOLT THREAD SIZE F1 - F4	M10	3/8 - 16 UNC
MOUNTING BOLT THREAD SIZE F5 - F6	M6	1/4 - 20 UNC

	MM	INCH
A	122.0	4.80
B	91.0	3.58
C	18.3	0.72
D	34.1	1.34
E	50.0	1.97
F	65.9	2.60
G	76.6	3.016
H	88.1	3.47

	MM	INCH
J	101.6	4.00
K	1.60	0.063
L	14.3	0.56
M	15.9	0.626
N	55.6	2.19
O	57.2	2.25
P	69.9	2.75
Q	71.5	2.815

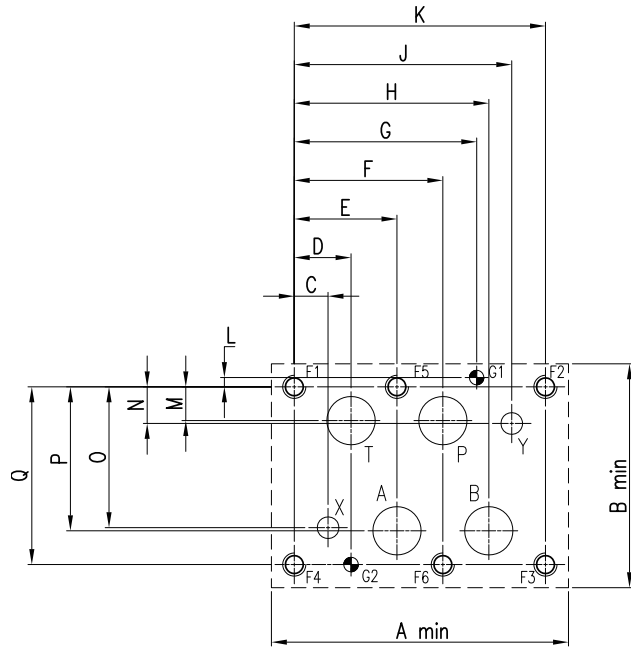


D08

	MM	INCH
P, A, B, T MAX	Ø 25.0	Ø 0.98
X, Y MAX	Ø 11.2	Ø 0.44
G MAX	Ø 7.50	Ø 0.30
MOUNTING BOLT THREAD SIZE	M12	1/2 - 13 UNC

	MM	INCH
A	154.0	6.00
B	116.0	4.57
C	17.5	0.69
D	29.4	1.157
E	53.2	2.09
F	77.0	3.03
G	94.5	3.719
H	100.8	3.97

	MM	INCH
J	112.7	4.44
K	130.2	5.125
L	4.80	0.187
M	17.5	0.69
N	19.0	0.75
O	73.0	2.874
P	74.6	2.93
Q	92.1	3.625



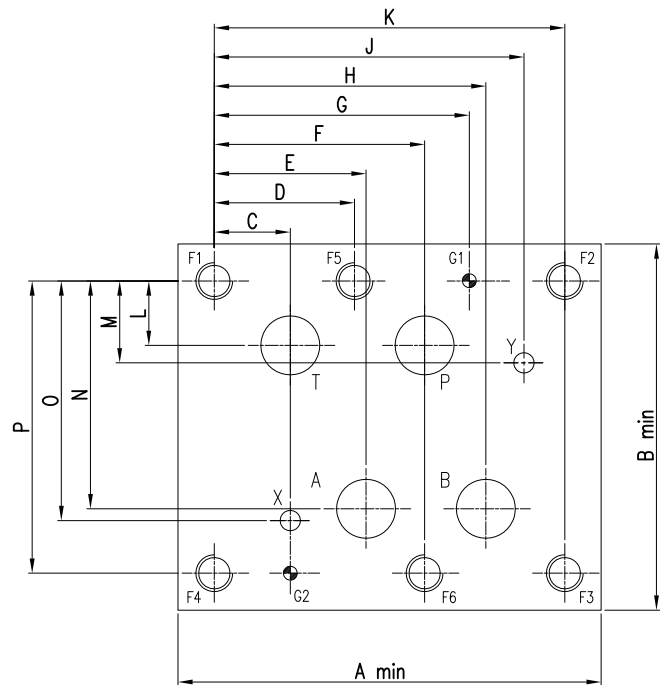
VED * HL * KD2 - HAZARDOUS LOCATION, PROPORTIONAL, DIRECT & PILOT OPERATED VALVES

D10

	MM	INCH
P, A, B, T MAX	∅ 32	∅ 1.25
X, Y MAX	∅ 11.2	∅ .44
G MAX	∅ 7.5	∅ .30
MOUNTING BOLT THREAD SIZE	M20	3/4-10 UNC

	MM	INCH
A	230.0	9.06
B	199.0	7.83
C	41.3	1.63
D	76.2	3.00
E	82.5	3.25
F	114.3	4.50
G	138.6	5.457
H	147.6	5.81

	MM	INCH
J	168.3	6.63
K	190.5	7.50
L	35.0	1.38
M	44.5	1.75
N	123.8	4.87
O	130.2	5.13
P	158.8	6.25



APPLICATION DATA

FLUIDS

All pressure drops shown on these data pages are based on 170 SUS fluid viscosity and 0.87 specific gravity. For any other specific gravity (G1) the pressure drop (ΔP) will be approx. $\Delta P1 = \Delta P (G1/G)$. See the chart for other viscosities.

FLUID VISCOSITIES	Cst	10	14.5	32	36	43	54	65	76	86	108	216	324	400
	SUS	60	75	150	170	200	250	300	350	400	500	1000	1500	1900
MULTIPLIER		0.77	0.81	0.97	1.00	1.04	1.10	1.15	1.20	1.24	1.31	1.56	1.72	1.83

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code G). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 180 degrees F causes the accelerated degradation of seals as well as degradation of the fluids physical and chemical properties.

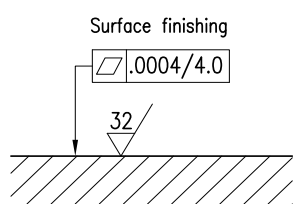
From a safety standpoint, temperatures above 130 degrees F are not recommended.

RANGE TEMPERATURES AMBIENT / FLUID:	A, G version	-4 to +176°F	-20 to +80°C
	AL version	-40 to +176°F	-40 to +80°C
FLUID VISCOSITY	Range	60-1900 SUS	10-400 cSt
	Recommended	120 SUS	25 cSt
FLUID CONTAMINATION	ISO 4406:1999 Class 20/18/15		

INSTALLATION

The configurations with centering and offset springs can be mounted in any position without impairing correct operation; instead, those without springs and with mechanical detent must be mounted with the longitudinal axis horizontal.

Valves are fixed by means of screws or tie rods on a flat surface with planarity and roughness equal to or better than those indicated in the relative symbols. If minimum values are not observed, fluid can easily leak between the valve and support surface.



BOLT KITS

D03 SIZE	BD03-125	Valve Only	1008406
D05* SIZE	BD05H-150-B	Valve Only	1009397
D07 SIZE	BD07-250	Valve Only	1009400
D08 SIZE	BD08-250	Valve Only	1009401
D10 SIZE	BD10-275	Valve Only	1013038

SEAL KIT

D03 SIZE	Buna Seal Kit	1013188
	Viton Seal Kit	1013096
D05* SIZE	Buna Seal Kit	1013174
	Viton Seal Kit	1013175
D07 SIZE	Buna Seal Kit	1013176
	Viton Seal Kit	1013177
D08 SIZE	Buna Seal Kit	1013178
	Viton Seal Kit	1013179
D10 SIZE	Buna Seal Kit	1013972
	Viton Seal Kit	1013973

SUBPLATES

D05 alt. A SIZE	AD05JESPS16S	Aluminium	SAE-16	351716AJ
	DD05JESPS16S	Ductile	SAE-16	351716AK
D07 SIZE	AD07SPS016S	Aluminium	SAE-16	1013039AB
	DD07SPS016S	Ductile	SAE-16	1013039AC
D08 SIZE	AD08SPS020S	Aluminium	SAE-20	265803AP
	DD08SPS020S	Ductile	SAE-20	265803AL
D10 SIZE	AD10SPS032S	Aluminium	SAE-32	1013040AB
	DD10SPS032S	Ductile	SAE-32	1013040AC

NOTES:

1. Max pressure for aluminum subplates: 3000 psi (210 bar)
2. Max pressure for ductile subplates: 5000 psi (350 bar)
3. Always verify subplate port size is proper for the application



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