



Installation and Maintenance Manual Series VXZ 2 Port Solenoid Valve

For future reference, please keep this manual in a safe place

This manual should be read in conjunction with the current valve catalogue

Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by label of "Caution", "Warning" or "Danger". To ensure safety, be sure to observe ISO4414 (Note1), JIS B 8370 (Note2) and other safety practices.

Note 1: ISO 4414: Pneumatic fluid power – Recommendations for the application of equipment to transmission and control systems.
Note 2: JIS B 8370: Pneumatic system axiom.

CAUTION : Operator error could result in injury or equipment damage.

WARNING: Operator error could result in serious injury or loss of life.

DANGER : In extreme conditions, there is a possible result of serious injury or loss of life.

WARNING

1. The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.

Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements.

2. Only trained personnel should operate pneumatically operated machinery and equipment.

Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

3. Do not service machinery/equipment or attempt to remove component until safety is confirmed.

1) Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.

2) When equipment is to be removed, confirm the safety process as mentioned above. Switch off air and electrical supplies and exhaust all residual compressed air in the system.

3) Before machinery/equipment is re-started, ensure all safety measures to prevent sudden movement of cylinders etc. (Bleed air into the system gradually to create back-pressure, i.e. incorporate a soft-start valve).

4. Contact SMC if the product is to be used in any of the following conditions:

1) Conditions and environments beyond the given specifications, or if product is used outdoors.

2) Installations in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverage, recreation equipment, emergency stop circuits, press applications, or safety equipment.

3) An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.

CAUTION

Ensure that the air supply system is filtered to 5 micron.

N.C Normally closed type (Fig 1)

Specifications

Model/Valve specifications

Port size	Orifice dia mm ø	Flow rate coefficient		Model	Min operating pressure difference MPa (kgf/cm ²)	Max. operating pressure difference MPa (kgf/cm ²)						Max. system pressure MPa (kgf/cm ²)	Weight g (Note)
		Cv	Effective orifice (mm ²)			Water		Air		Oil			
1/4	10	1.9	34	VXZ2230-02	0	1.0 (10.2)	0.7 (7.1)	1.0 (10.2)	0.7 (7.1)	0.7 (7.1)	0.7 (7.1)	1.5 (15.3)	550
3/8	10	2.4	43	VXZ2230-03		1.0 (10.2)	0.7 (7.1)	1.0 (10.2)	0.7 (7.1)	0.7 (7.1)	0.7 (7.1)		550
1/2	15	5.3	95	VXZ2240-04		1.0 (10.2)	0.7 (7.1)	1.0 (10.2)	0.7 (7.1)	0.7 (7.1)	0.7 (7.1)		760
3/4	20	9.2	165	VXZ2350-06		1.0 (10.2)	1.0 (10.2)	1.0 (10.2)	1.0 (10.2)	0.7 (7.1)	0.7 (7.1)		1,300
1	25	12	215	VXZ2360-10		1.0 (10.2)	1.0 (10.2)	1.0 (10.2)	1.0 (10.2)	0.7 (7.1)	0.7 (7.1)		1,480

Note: Values for the grommet type. Add 10g for the conduit type, 30g for the DIN connector type, and 60g for the terminal type.

Solenoid specifications

Model	Power supply	Frequency Hz	Apparent power VA		Power consumption W (Holding)	Temp. rise °C (Rated voltage)
			Inrush	Holding		
VXZ22	AC	50	60 (53)	18	7.5	60
	DC	60	51 (44)	12	6	50
VXZ23	AC	50	80	21	11	65
	DC	60	67	17	9.5	60

Note: The return voltage is 20% or more of the rated voltage for AC and 2% or more for DC. The allowable voltage fluctuation rate is ±10% of the rated value for both AC and DC. When the ambient temperature is 20°C ±5°C and rated voltage is applied. Coil change from AC to DC or DC to AC is impossible because the iron core shapes are different. The apparent power in the parentheses is for VXZ2230.

Installation

WARNING

Ensure all air and power supplies are ISOLATED before commencing installation.

Do not install these valves in explosive atmospheres. If a valve is exposed to oil and/or water droplets ensure that it is protected.

If it is intended to energise a valve for an extended period of time please consult SMC.

This valve is NOT intended to be used as a 'Dump' valve.

Symbol

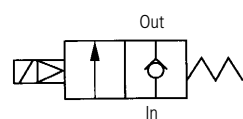


Fig 1

N.O Normally open type (Fig 2)

Model/Valve specifications

Port size	Orifice dia mm ø	Flow rate coefficient		Model	Min operating pressure difference MPa (kgf/cm ²)	Max. operating pressure difference MPa (kgf/cm ²)						Max. system pressure MPa (kgf/cm ²)	Weight g (Note)
		Cv	Effective orifice (mm ²)			Water		Air		Oil			
		AC	DC			AC	DC	AC	DC	AC	DC		
1/4	10	1.9	34	VXZ2232-02	0	0.7 (7.1)	0.6 (6.1)	0.7 (7.1)	0.6 (6.1)	0.7 (7.1)	0.6 (6.1)	1.5 (15.3)	600
3/8	10	2.4	43	VXZ2232-03		0.7 (7.1)	0.6 (6.1)	0.7 (7.1)	0.6 (6.1)	0.7 (7.1)	0.6 (6.1)		600
1/2	15	5.3	95	VXZ2242-04		0.7 (7.1)	0.6 (6.1)	0.7 (7.1)	0.6 (6.1)	0.7 (7.1)	0.6 (6.1)		850
3/4	20	9.2	165	VXZ2352-06		0.7 (7.1)	0.6 (6.1)	0.7 (7.1)	0.6 (6.1)	0.7 (7.1)	0.6 (6.1)		1,370
1	25	12	215	VXZ2362-10		0.7 (7.1)	0.6 (6.1)	0.7 (7.1)	0.6 (6.1)	0.7 (7.1)	0.6 (6.1)		1,550

Note: Values for the grommet type. Add 10g for the conduit type, 30g for the DIN connector type, and 60g for the terminal type.

Solenoid specifications

Model	Power supply	Frequency Hz	Apparent power VA		Power consumption W (Holding)	Temp. rise °C (Rated voltage)
			Inrush	Holding		
VXZ22	AC	50	66 (60)	20	8	55
	DC	60	57 (51)	15	6.5	45
VXZ23	AC	50	93	25	11	60
	DC	60	79	20	9.5	50

Note: The return voltage is 20% or more of the rated voltage for AC and 5% or more for DC. The allowable voltage fluctuation rate is ±10% of the rated value for both AC and DC. When the ambient temperature is 20°C ±5°C and rated voltage is applied. Coil change from AC to DC or DC to AC is impossible because the iron core shapes are different. The apparent power in the parentheses is for VXZ2232.

Symbol

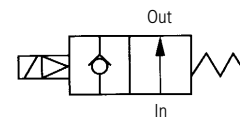
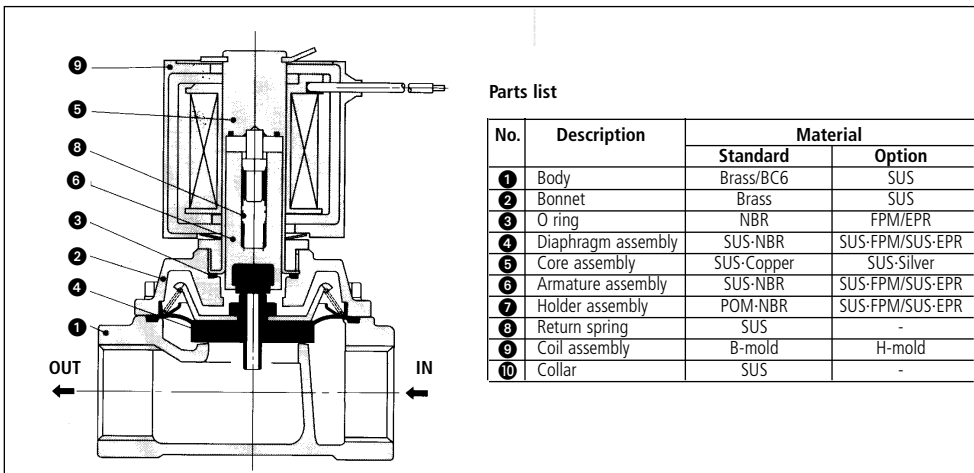


Fig 2

Construction N.C normally closed type (Fig 3)

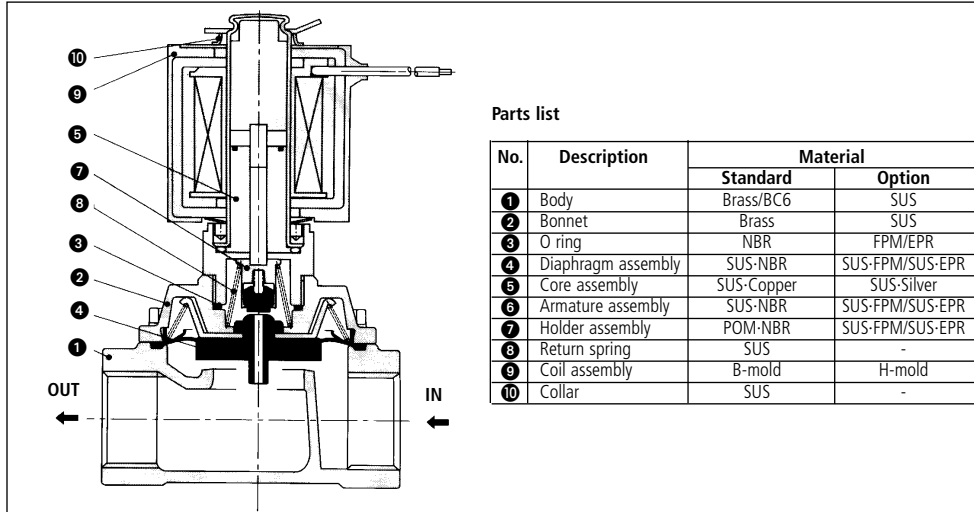


Parts list

No.	Description	Material	
		Standard	Option
1	Body	Brass/BC6	SUS
2	Bonnet	Brass	SUS
3	O ring	NBR	FPM/EPR
4	Diaphragm assembly	SUS-NBR	SUS-FPM/SUS-EPR
5	Core assembly	SUS-Copper	SUS-Silver
6	Armature assembly	SUS-NBR	SUS-FPM/SUS-EPR
7	Holder assembly	POM-NBR	SUS-FPM/SUS-EPR
8	Return spring	SUS	-
9	Coil assembly	B-mold	H-mold
10	Collar	SUS	-

Fig 3

Construction N.O normally open type (Fig 4)



Parts list

No.	Description	Material	
		Standard	Option
1	Body	Brass/BC6	SUS
2	Bonnet	Brass	SUS
3	O ring	NBR	FPM/EPR
4	Diaphragm assembly	SUS-NBR	SUS-FPM/SUS-EPR
5	Core assembly	SUS-Copper	SUS-Silver
6	Armature assembly	SUS-NBR	SUS-FPM/SUS-EPR
7	Holder assembly	POM-NBR	SUS-FPM/SUS-EPR
8	Return spring	SUS	-
9	Coil assembly	B-mold	H-mold
10	Collar	SUS	-

Fig 4

Detail drawing N.C/N.O. (Fig 5)

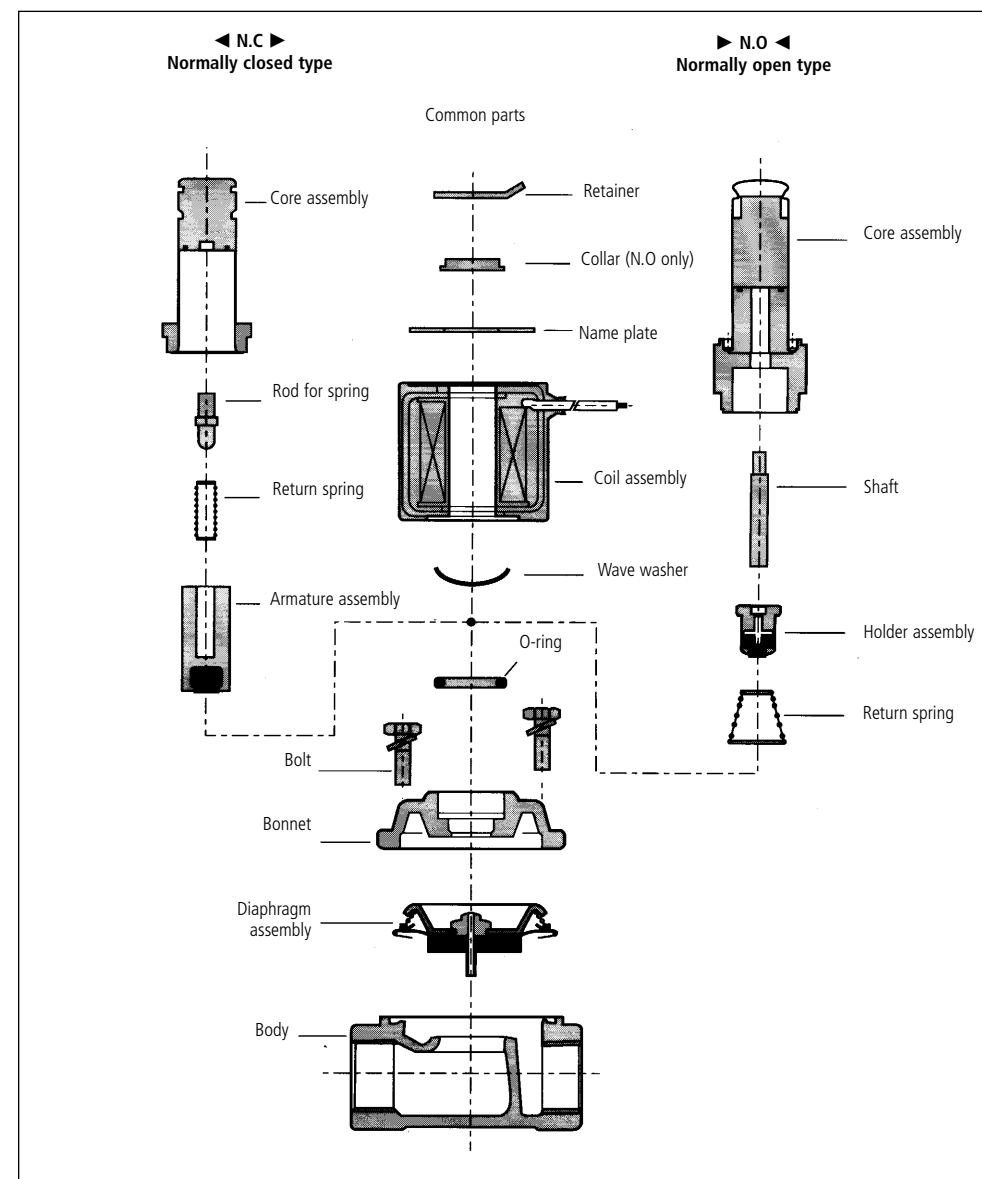
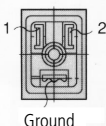


Fig 5

DIN connector wiring (Fig 6)

The electrical connections for the DIN connector are shown in Fig 6. Note: Minimum wire diameter is 0.5mm². To prevent damage due to surge voltage fit a voltage suppresser in parallel with the solenoid valve. Leakage voltage should be kept to within 20% or less of the rated voltage for AC, 2% or less of the rated voltage for DC.

With DIN connector



Terminal No.	1	2
DIN connector	+	-

Fig 6

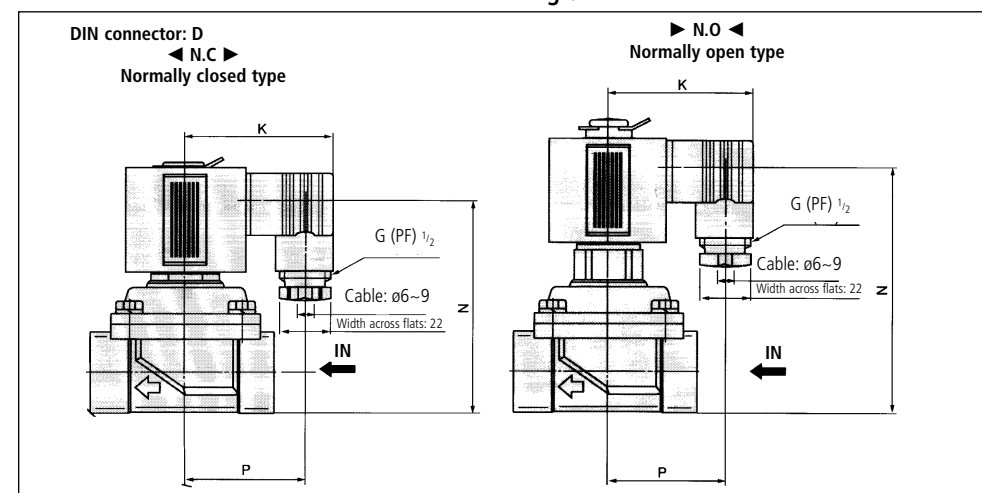


Fig 7

Flow rate characteristics (AIR) (Fig 8)

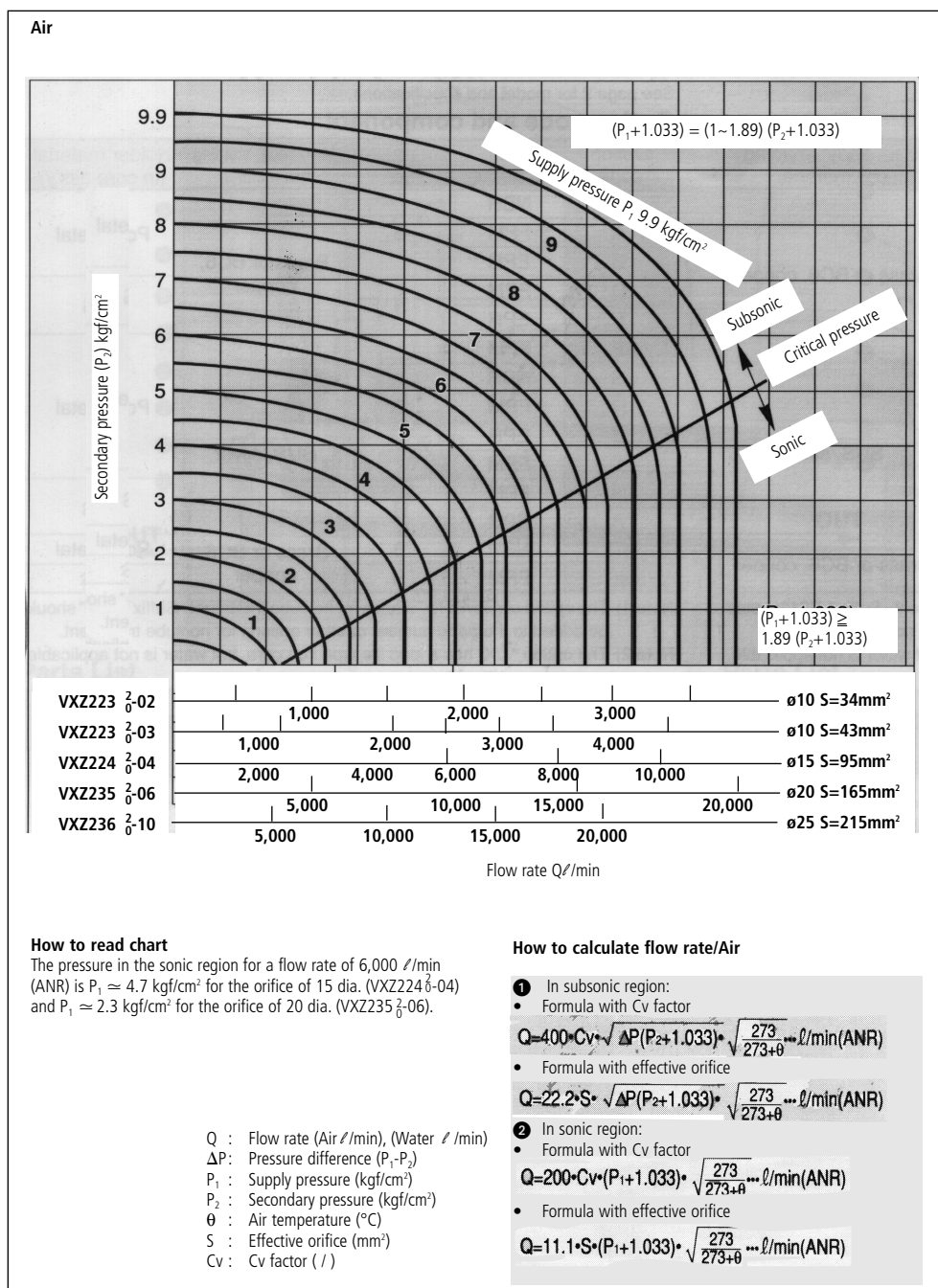


Fig 8

Operation (Figs 10, 11, 12)

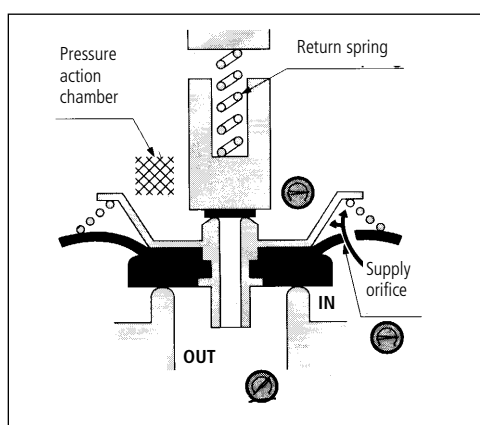


Fig 10

With the solenoid coil de-energised fluid enters the valve via the IN port and fills the pressure action chamber. The main valve remains closed via the action of the force pushing the valve down, and the reaction of the return spring.

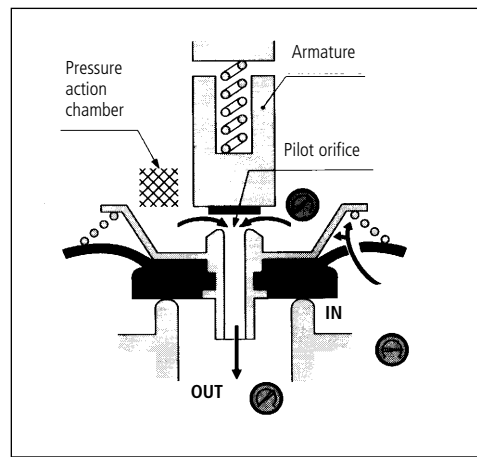


Fig 11

When the coil is energised the armature is attracted and the pilot orifice starts to open. The fluid in the pressure action chamber flows through the pilot orifice to the OUT port.

Flow rate characteristics (WATER) (Fig 9)

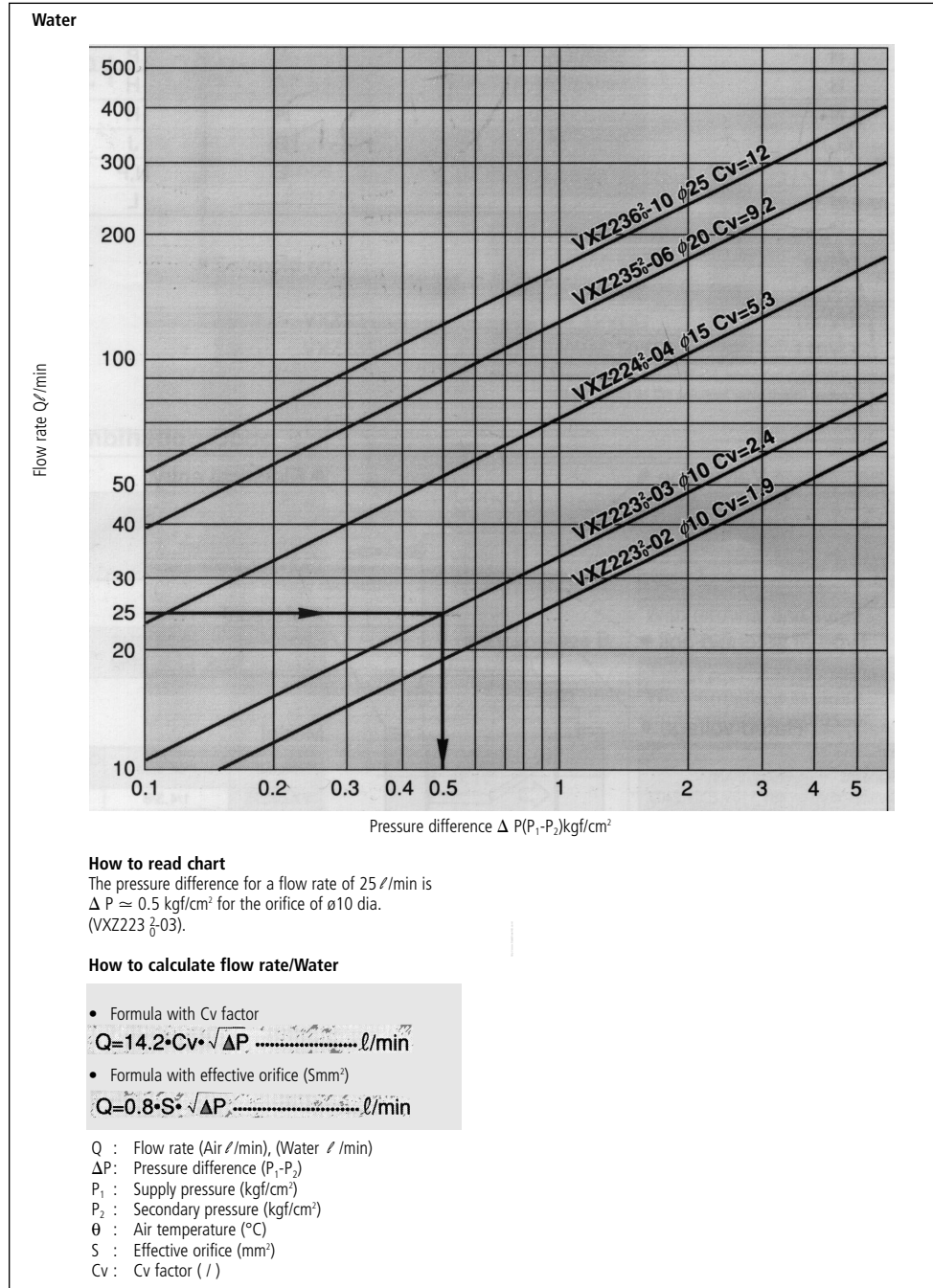


Fig 9

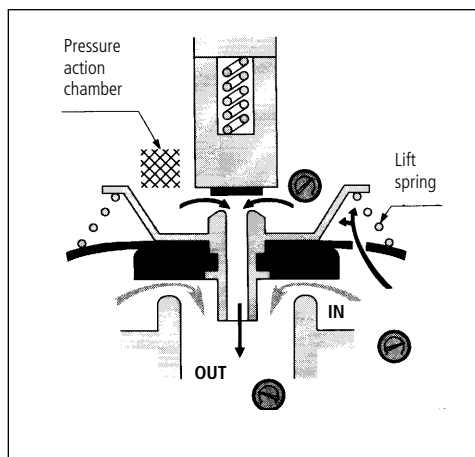


Fig 12

As the fluid is discharged through the pilot orifice, the pressure in the pressure action chamber decreases. The force pushing the valve down weakens, allowing the lift spring to overcome the said force, opening the main valve.

Solenoid coil replacement (Fig 13)

Replacement is the reverse of the above.

WARNING

It is NOT possible to change a coil from AC to DC or from DC to AC due to the differences in the iron core design. The allowable voltage fluctuation is +/- 10% of the rated value for both AC and DC.

CAUTION

DO NOT 'ground' the pipe runs as this will cause electrolytic corrosion. DO NOT subject the coil to excessive force. When connecting piping apply a spanner to the outside of the pipe mounting area. The solenoid valve may be mounted in any orientation, but exercise caution when mounting in the inverted position as fluid will adhere to the iron core. Avoid this mounting position if possible.

Should you require additional information please contact your local SMC office, see details below.

When you enquire about the product, please contact the following

SMC Corporation:			
ENGLAND	Phone 01908-563888	TURKEY	Phone 212-2211512
ITALY	Phone 02-92711	GERMANY	Phone 6103-402-0
HOLLAND	Phone 020-5318888	FRANCE	Phone 01-64-76-10-00
SWITZERLAND	Phone 052-34-0022	SWEDEN	Phone 08-603 07 00
SPAIN	Phone 945-184100	AUSTRIA	Phone 02262-62-280
	Phone 902-255255	IRELAND	Phone 01-4501822
GREECE	Phone 01-3426076	DENMARK	Phone 8738-0800
FINLAND	Phone 09-68 10 21	NORWAY	Phone 67-12 90 20
BELGIUM	Phone 03-3551464	POLAND	Phone 48-22-6131847

When the IN port pressure is zero, or pressure is very low, the action force of the lift spring opens the main valve.

Solenoid coil removal (Fig 13)

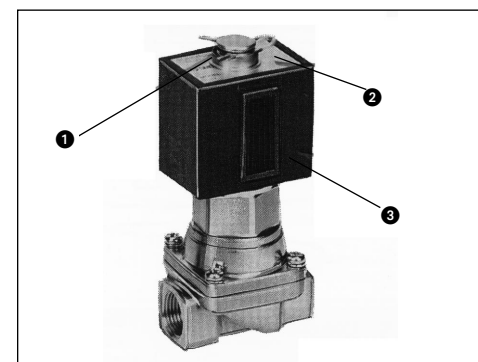


Fig 13

Remove spring clip 1 and retain. Lift off identification plate 2 and retain. Lift off solenoid coil 3.