



### STANDARD EQUIPMENT

No	Description	Qty	Type
1	MAIN VALVE HYTROL AE/GE/NGE	1	100-01
2	ORIFICE PLATE ASSEMBLY	1	X52-A
3	ISOLATION BALL VALVE	3	RB-117
4	STRAINER WITH INCORPORATED ORIFICE	1	X44-A
5	NEEDLE VALVE	1	6120
6	DIFFERENTIAL PRESSURE CONTROL	1	CDHS-18
7	AUXILIARY VALVE HYTROL	1	100-KHR
8A	3-WAY SOLENOID VALVE (NO)	1	311-D
8B	3-WAY SOLENOID VALVE (NC)	1	311-C

### OPTIONAL FEATURES

No	Description	Qty	Type
C	ONE-WAY FLOW CONTROL (CLOSING SPEED)	1	CV
H1	DRAIN TO MAIN VALVE OUTLET	1	RB-117
O	NYLON PIPE Ø 6/3 mm	1	-
P	2-WAY PRESSURE COCK (Rp 3/8")	2	RB-117
S	ONE-WAY FLOW CONTROL (OPENING SPEED)	1	CV

### NOTES

AE/GE : DN 32 - DN 400 / NGE : DN 50 - DN 600

OPTIONAL FEATURES : \_\_\_\_\_  
NOT FURNISHED BY CLA-VAL : \_\_\_\_\_

Orifice plate assembly X52-A (2) may be fixed directly to the main valve outlet flange, however, better control is obtained, if it is mounted according to the following recommendation : distance X = 5x pipe diameter, distance Y = 3x pipe diameter.

### ► Operating data

#### 1.1 ► SOLENOID CONTROL FEATURE

Solenoid controls 311-D (8A) and 311-C (8B) are a direct acting, 3-way solenoid control that changes position when the coil is energized or de-energized. This applies or relieves pressure in the cover chamber of auxiliary valve (7) providing the operations shown in the following table:

43E-01			
Solenoid 311-D (8A)		Auxiliary valve (7)	Main valve (1)
State	Ports connected	Position	Position
Energized	1 - 2	Open	Open under command of control (6)
De-energized	0 - 1	Closed	Closed

43D-01			
Solenoid 311-C (8B)		Auxiliary valve (7)	Main valve (1)
State	Ports connected	Position	Position
Energized	2 - 1	Closed	Closed
De-energized	1 - 0	Open	Open under command of control (6)

#### 1.2 ► RATE OF FLOW FEATURE

Pressure differential control CDHS-18 (6) is "normally open" and responds to differential pressure changes sensed across orifice plate assembly (2). An increase in differential pressure tends to close control (6) and a decrease in differential pressure tends to open control (6). This causes main valve cover pressure to vary and the main valve modulate (opens and closes) maintaining a relatively constant rate of flow.

**Pressure differential control (6) adjustment:** Turn the adjusting screw clockwise to accelerate the rate of flow.

#### 1.3 ► CLOSING / OPENING SPEED CONTROL

Calibrated orifice of strainer X44-A (4) and needle valve 6120 (5) control the closing speed of the main valve (1). Needle valve (5) controls the closing speed of the main valve (1).

**Needle valve (5) adjustment:** Turn the adjusting screw of needle valve (5) clockwise to make the main valve (1) close/open more slowly or counter clockwise to react faster.

**Note:** Do not close needle valve (5) completely or the main valve (1) will not close or open (suggested initial setting of needle valve is 1 turn open).

If high speed opening and slow speed closing of main valve (1) are required by the hydraulic service's conditions, it may be necessary to replace the original orifice plug of strainer (4) by a smaller one.

### 1.4 ▶ (E\*) EUROPEAN STANDARDS

ITEM (3) - Isolation ball valve:

The isolation ball valves RB-117 (3) are used to isolate the pilot system from main line pressure. These isolation ball valves must be open during normal operation.

ITEM (4) - Y-Strainer with incorporated orifice:

The strainer X44-A (4) is installed in the pilot supply line to protect the pilot system from foreign particles. The strainer screen must be cleaned periodically.

### 1.5 ▶ OPTIONAL FEATURES

Suffix (C) - Closing speed:

Flow control CV (C) regulates the closing speed of main valve (1).

**Flow control (C) adjustment:** Turn the adjusting screw clockwise to make the valve close more slowly.

Suffix (H1) - Solenoid drain:

The drain port of solenoid valve (8) = "R" is not vented to atmosphere, but directly connected to the outlet of main valve (1).

Suffix (O) - Nylon tube:

The nylon tube  $\varnothing$  6/3 mm allows the connection between the control (6) and the orifice plate (2).

**Note:** It is however recommended to install a rigid pipe  $\varnothing$  6/4 mm (not delivered by CLA-VAL), in order to increase the safety of operation.

Suffix (P) - 2-Way pressure cock:

These two 2-way pressure cock allow the installation of a differential pressure gauge.

Suffix (S) - Opening speed:

Flow control CV (S) regulates the opening speed of main valve (1).

**Flow control (S) adjustment:** Turn the adjusting screw clockwise to make the valve open more slowly.

### 1.6 ▶ CHECK LIST FOR PROPER OPERATION

- System valves open upstream and downstream.
- Air removed from the main valve cover and pilot system at all high points.
- Isolation ball valves (3) open.
- Periodic cleaning of strainer (4) is recommended.
- Needle valve (5) or [Optional feature (C) or (S)] open from 1 turn.
- Orifice plate (2) mounted downstream of main valve (1) in flow direction as marked on the orifice plate.
- Manual solenoid valve (8) override disengaged.
- Correct voltage to solenoid control.
- Sensing line  $\varnothing$  6/3 mm [optional feature (O)] or  $\varnothing$  6/4 mm [rigid pipe] correctly assembled.
- Pressure cocks [optional feature (P)] closed.