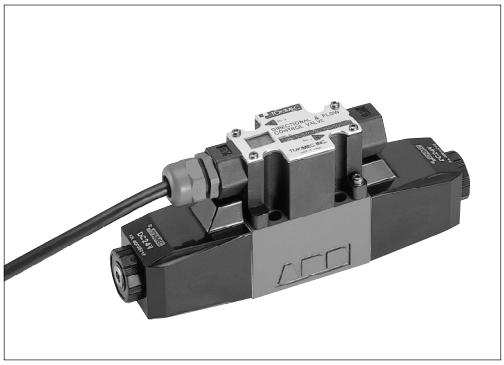
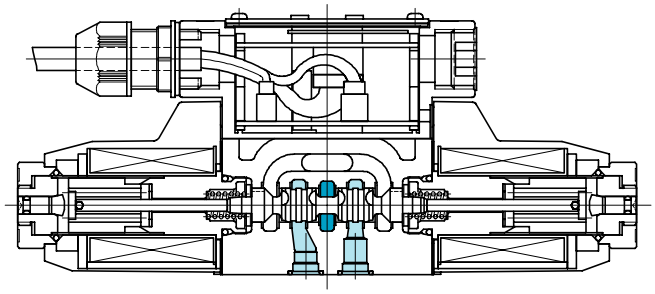
Directional and flow control valves "COMNICA"





- COMINCA valves offer independent setting for acceleration and deceleration which is indispensable for shockless operation. High speed positioning which is difficult with conventional shockless valves and adjustable speed setting is possible.
- Onboard microprocessor allows setting of required parameters without valve to valve variation. Push button operation while monitoring the integrated digital indicator enables simple, repeatable setting and adjustment. Handheld setting device provides same setting operation as on the valve.
- Compact, space-saving design with same configuration and robust construction as standard solenoid valves. Ease-of-use design facilitates operation as well as installation and maintenance with features such as operation confirmation when valve is deenergized, manual override pins, and reduced wiring.
- Like standard solenoid valves, can be connected to general purpose relays, PLC's, etc.

Model Code

COM–3/5 Series

COM-3-2C-30-CH-11

1 2 3 4 5 6 7

1 COMNICA Valve
2 Mounting
3:ISO 4401-03
5:ISO 4401-AC-05-4-A
3 Spool
2:Type 2
33:Type 33
4 Spring sets
C:Spring centered (3 position)
5 Max. control flow
See 'Specifications'
6 Control function
SH:Shockless
CH:3 Channel setting
AN:Analog input
7 Design no.
10:COM-5
11:COM-3

COM–7/8 Series

COM-7-2C-130-CH-(E)-(T)-10

1 2 3 4 5 6 7 8 9

1 COMNICA Valve
2 Mounting
7:ISO 4401-AD-07-4-A
8:ISO 4401-AE-08-4-A
3 Spool
2:Type 2
33:Type 33
4 Spring set
C:Spring centered (3 position)
5 Max. control flow
See 'Specifications'
6 Control function
SH:Shockless
CH:3 Channel setting
AN:Analog input
7 Pilot
Omitted for internal pilot
E: External pilot
8 Drain
Omitted for external drain
T: Internal drain
9 Design no.

Specifications

Model	COM-3	COM-5	COM-7	COM-8
Rated pressure MPa	24.5	20.6	24.5	
Allowable tank port back pressure MPa	13.7		Internal dr. : 13.7 External dr. : 24.5	
Max. control flow L/min	*1 30	*1 70	*2 130	*2 250
Min. control flow L/min	*1 0.5	*1 1.5	*2 3	*2 5
Repeatability	Less than 1 % of max. flow			
Flow setting	Solenoids a ,b each 100 segments			
Response time ms	*3 50	*3 100	*3 70	
Acceleration-deceleration time setting	0～9.9 s (0.1 s unit) ／ 0～0.99 s (0.01 s unit) switchable			
Ambient temp. ℃	0～60			
Fluid temp. ℃	7～60			
Fluid viscosity mm^2/s	20～300			
Vibration resistance	45 m/s^2 (JIS D 1601)			
Shock resistance	300 m/s^2 (JIS C 0041)			
Waterproof, dustproof	IP 54			
Voltage	DC 21.6～28 V			
Max. power consumption	40 W (DC24 V 1.67 A)			
Wiring	1 m lead wire included			
Input-Output Signals	See table below			
Weight kg	2.5	6.5	12	20

*1 Supply pressure (in case of 6.9 MPa)
*2 Valve differential pressure (in case of 1 MPa)
*3 0⇔100 % operation

Control Functions

SH Type (Shockless)
Simple shockless and speed control by selecting A or B direction with contact signal of PLC, etc. In addition easy position control can be achieved by using the HALT function.

CH Type (Contact Point Input)
Enables selection of three flows - high, medium, low speeds - for A, B direction and independent setting of acceleration, deceleration between the three flows.

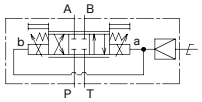
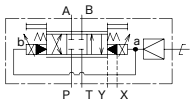
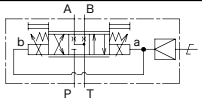
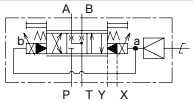
AN Type (Analog Input)
Speed (flow) setting in real time with analog voltage.
Acceleration, deceleration time setting possible.

Input-output signal

Control Function	Input	Output
SH	Standard signal a, b solenoid, each 1 point Stop (HALT) input (Photocoupler insulation, sink type)	—
CH	Setting selection signal a, b solenoid, each 3 points Emergency stop (STOP) input (Two-way photocoupler insulation; common source, sink)	READY (operation ready) output (Open collector output)
AN	* DC±10 V analog input Emergency stop (STOP) input (Photocoupler insulation, sink type)	—

- Contact point input ON: input common •Ì voltage between contact point input, DC15V~35V
- Contact point input OFF: input common •Ì voltage between contact point input, DC 0V~3V
- Contact point output: max. load current 50Ma
*All contact signal except for AN type DC±10V signal.

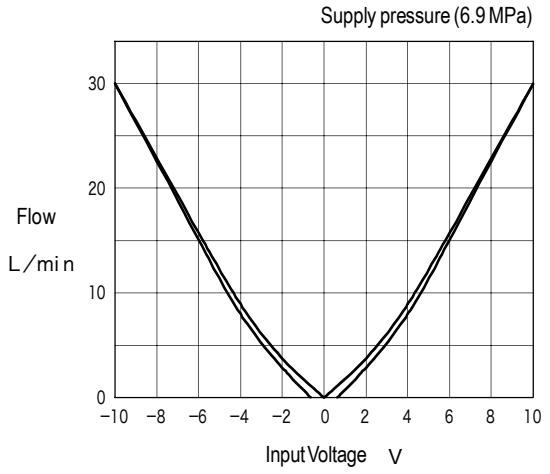
Spools

Neutral Position Spool Configuration			Functional Symbol COM-3/5	Functional Symbol COM-7/8
2		Closed centered		
33		A-B-T connection with restrictor		

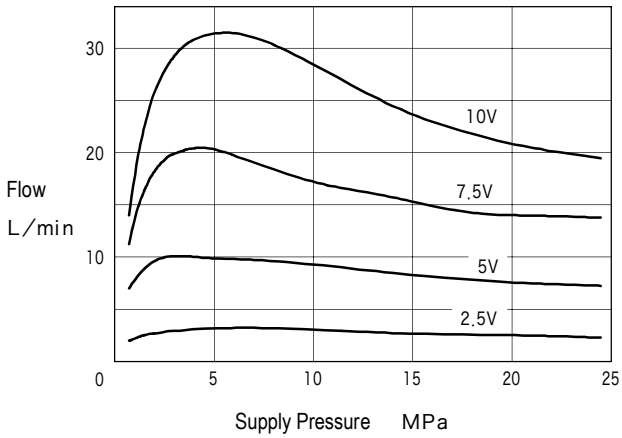
Performance Curve (viscosity 20 mm²/s , specific gravity 0.87)

(Example) COM-3-2C-30-AN-11

Input Voltage - Flow Characteristics

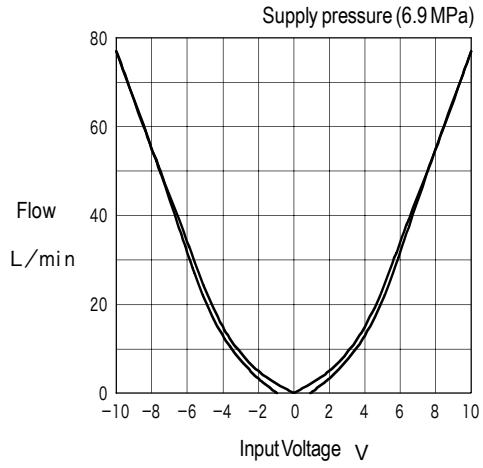


Supply Pressure - Flow Characteristics

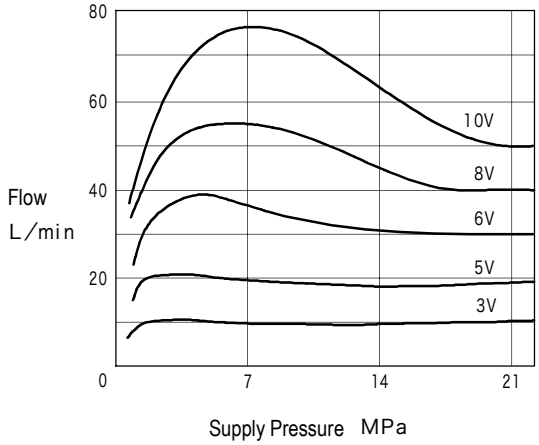


(Example) COM-5-2C-70-AN-10

Input Voltage - Flow Characteristics

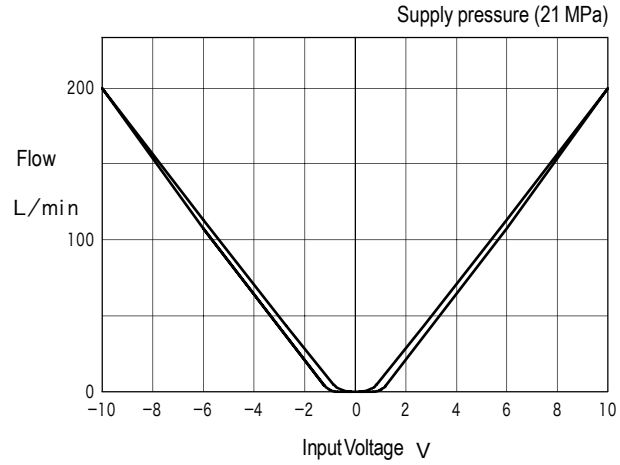


Supply Pressure - Flow Characteristics

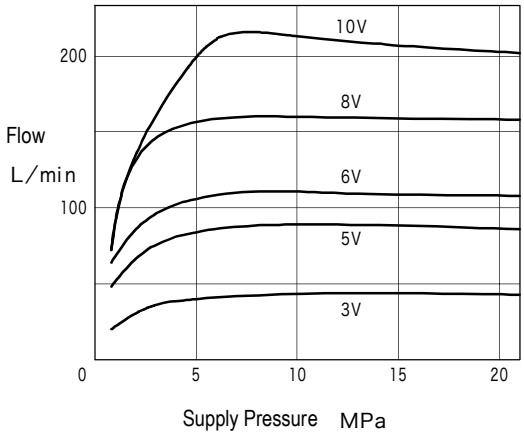


(Example) COM-7-2C-130-AN-10

Input Voltage - Flow Characteristics



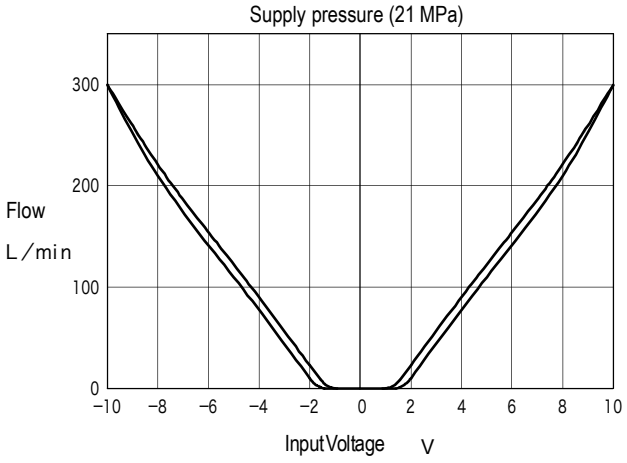
Supply Pressure - Flow Characteristics



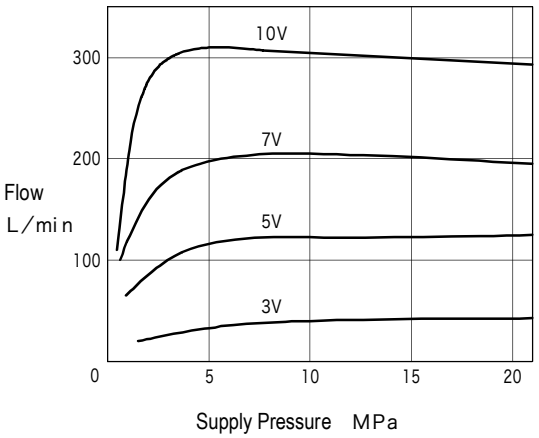
Performance Curves (viscosity 20 mm²/s, specific gravity 0.87)

(Example) COM-8-2C-250-AN-10

Input Voltage - Flow Characteristics



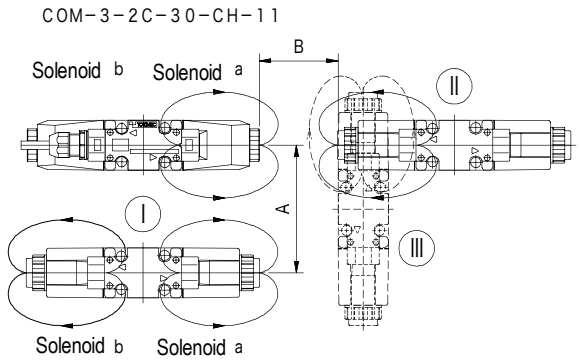
Supply Pressure - Flow Characteristics



Operating Considerations

1. Mounting orientation
   Valve should be mounted with spool axis oriented horizontally.
2. T port
   Abnormal surge pressures in T port should be kept to below 13.7 MPa. Valve should always be filled with oil.
3. Signal line
   Ends of signal wires not used should be insulated and short circuits should be prevented.
4. Wiring specifications
   When using extended lead wires for COMNICA valves, insure that cables are heat and oil resistant and of proper size as described below.
   • Power supply (24V or 0V)
   AWG18 or above 0.75mm²
   • Contact point signal or analog input
   AWG22 or above 0.3mm²
5. Contact point input-output current
   When contact signal is input, the following currents flow to the contact points of the PLC, relay, etc. Care should be paid to the current limitations of external devices.
   Setting point current (A) ≒ (contact point input voltage -1)/15000
   Operation output (CH type only) max. load current is 50mA and care should be paid to the load on the PLC, relay, etc. Especially when connecting directly to LED, etc., serially connect resistance to operational output + or operational output -, and limit current.
   Minimum applicable load (Ω) ≒ (load voltage-1.2)/0.05
6. Manual operation
   Valve can be manually shifted by pushing the manual override pins but force required will increase as tank line back pressure increases.
7. Water and dust protection class
   Water and dust protection class is IP54. Separate protection should be implemented for jets from nozzles, etc. In order to maintain water and dust resistance, nameplate and packing should be tightened with the tap pins after adjustment of settings. Tightening torque: 0.34 ~ 0.53Nm
8. EMI (electro-magnetic interference)
   Valve control flow may vary with changes in the magnetic field.
   As shown in the examples below, when flow is controlled by solenoid “a” and a nearby solenoid valve is energized, controlled flow of the COMNICA valve may increase or decrease as shown in the table.
   Therefore caution should be exercised when COMNICA valves are operated in proximity to solenoid valves

Example 1 .COM-3



Flow Variation of COMNICA Valve When Solenoid Valve Switched at 1 L/min

i)① Valve position

Flow variation :L/min

A mm	DG4V-3 Sol. 'a' energized	DG4V-3 Sol. 'b' energized
47	0. 50	0
57	0. 20	0
97	0. 10	0
147	0. 02	0

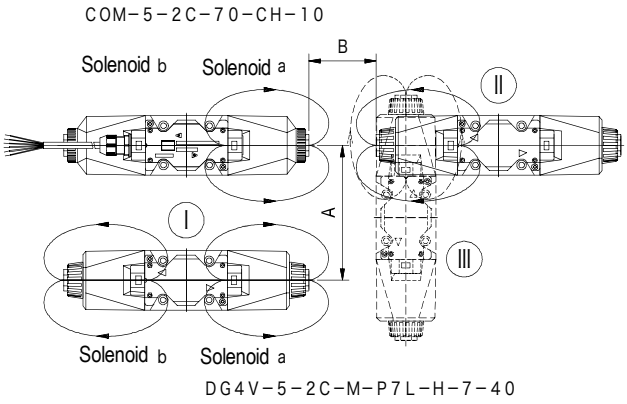
ii)②③ Valve position

Flow variation :L/min

B mm	DG4V-3 Sol. energized
25	0. 10
50	0. 05

Operating Considerations

(Example) 2.COM-5



Flow Variation of COMNICA Valve When Solenoid Valve Switched at 5 L/min

i) ① Valve position

Flow variation : L/min

A mm	DG4V-5 Sol. 'a' energized	DG4V-5 Sol. 'b' energized
70	1. 40	0
80	0. 65	0
120	0. 30	0
170	0. 10	0

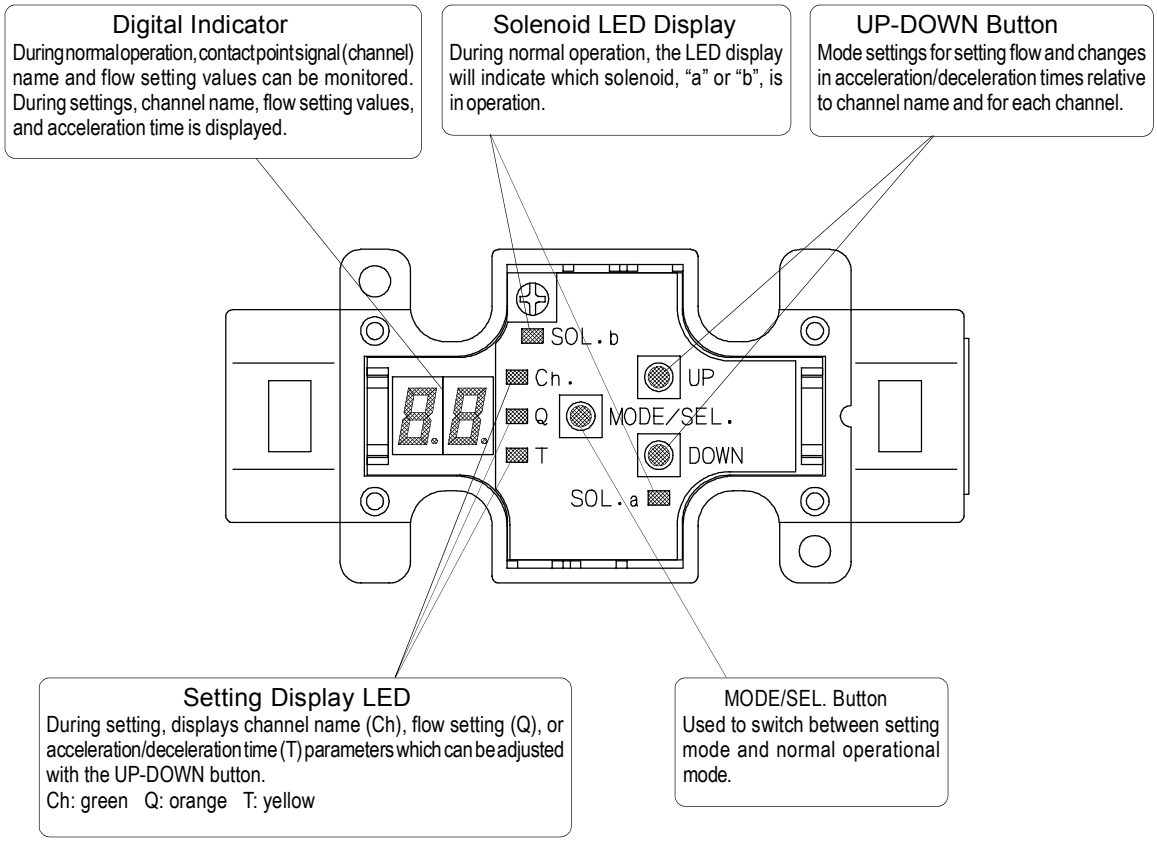
ii) ⑪⑩ Valve position

Flow variation : L/min

B mm	DG4V-5 Sol. energized
25	0. 30
50	0. 10

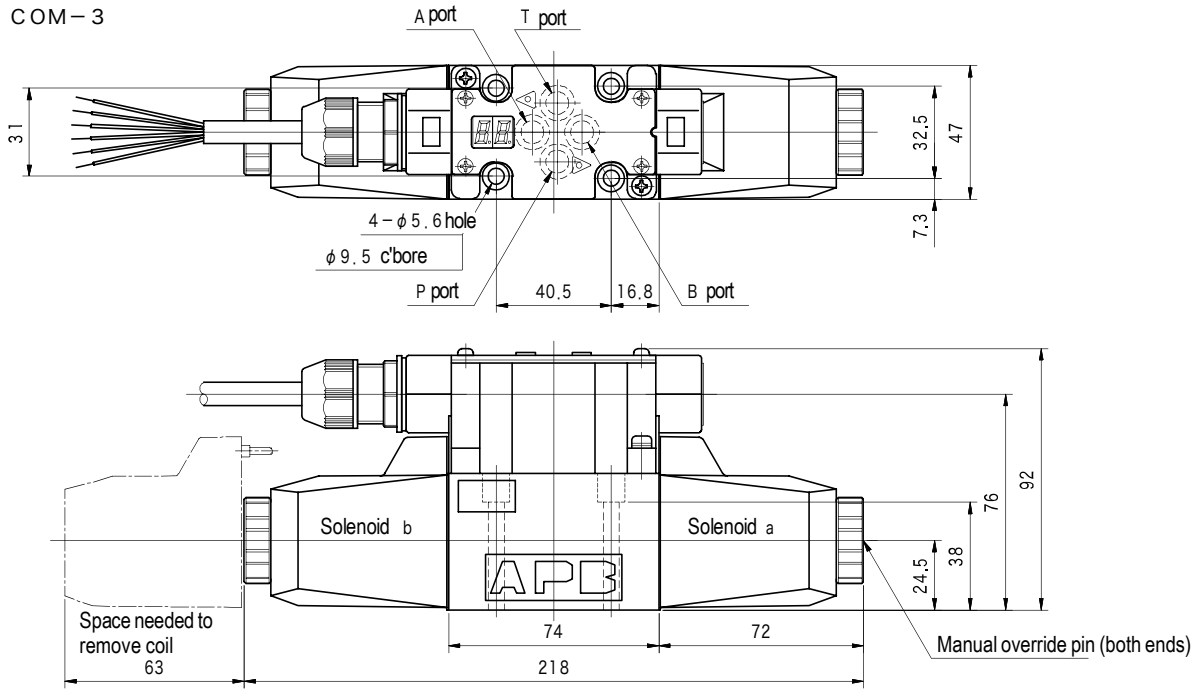
Notes regarding the above examples.
- Orientation of electromagnetic fields shown in the illustration may differ according to the electrical wiring.
- Solenoid valves placed in proximity in positions other than those illustrated may also increase/decrease COMNICA valve controlled flows.
- Similar interference may occur with COM-7/8. Consult TOKIMEC as necessary.

Controller Unit Nomenclature and Functions

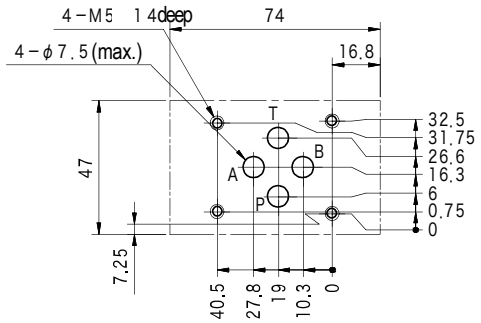


Dimensions

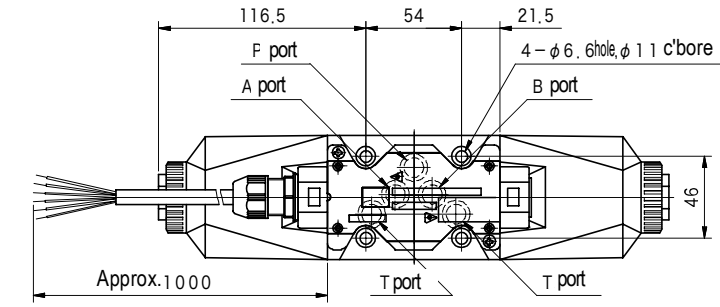
COM－3



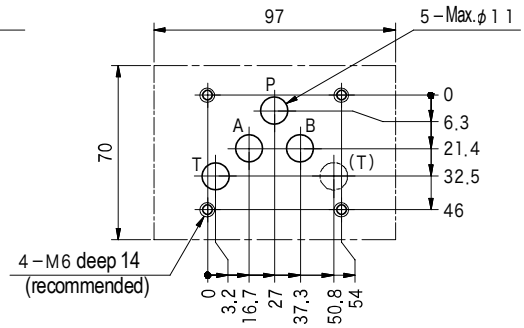
• Mounting Dimensions（ISO 4401－03）

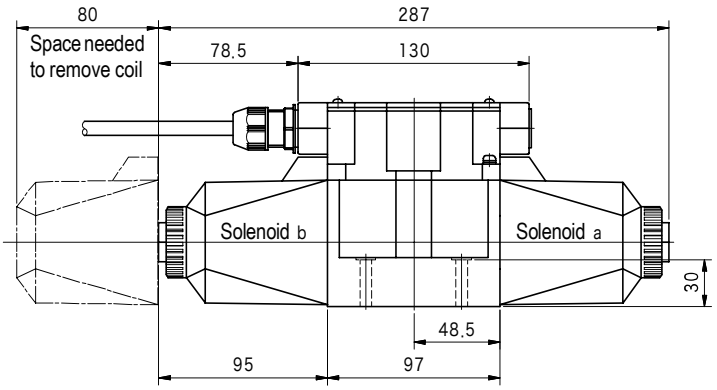


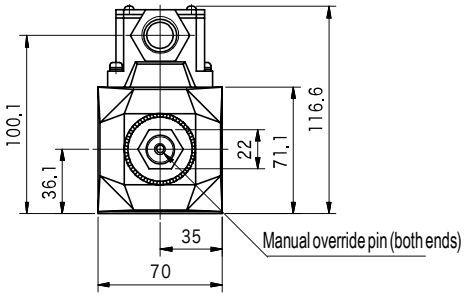
COM－5



• Mounting Dimensions
ISO 4401－AC－05－4－A

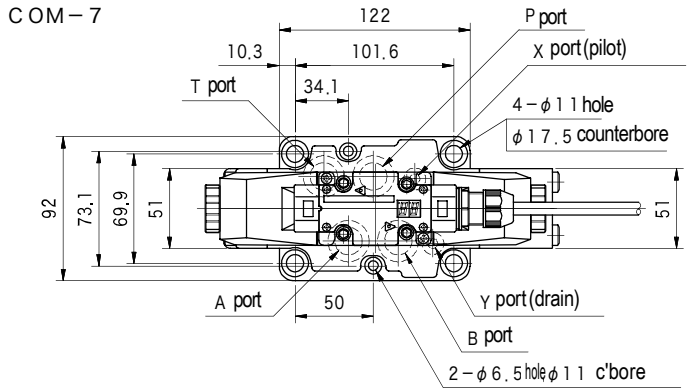




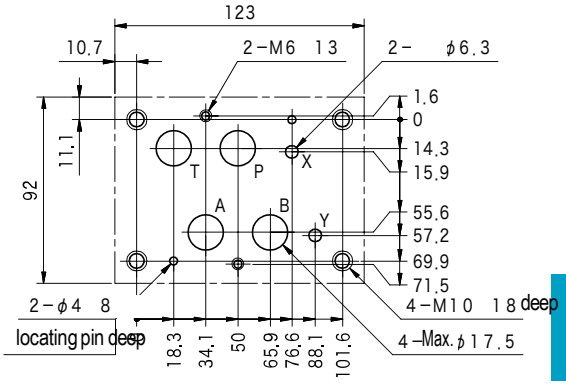


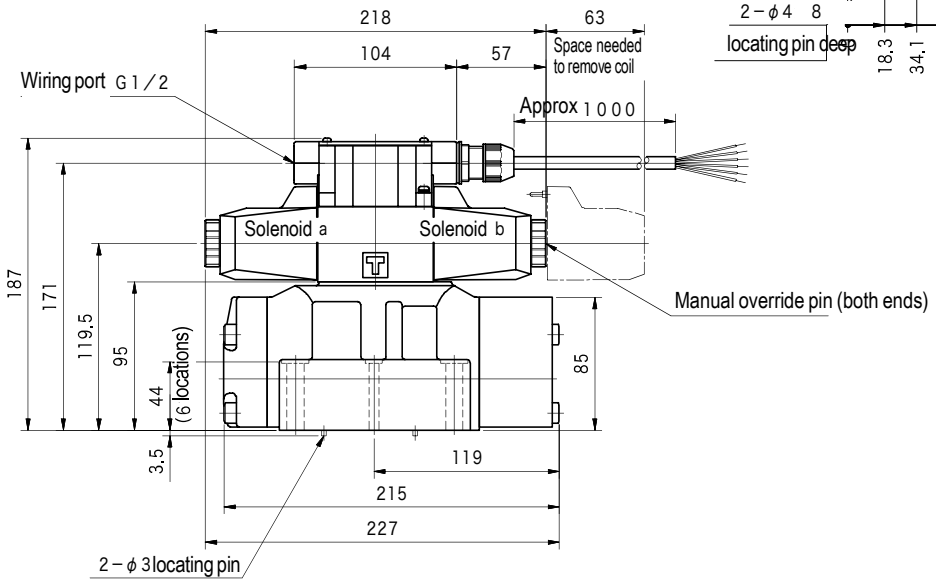
Dimensions

COM－7

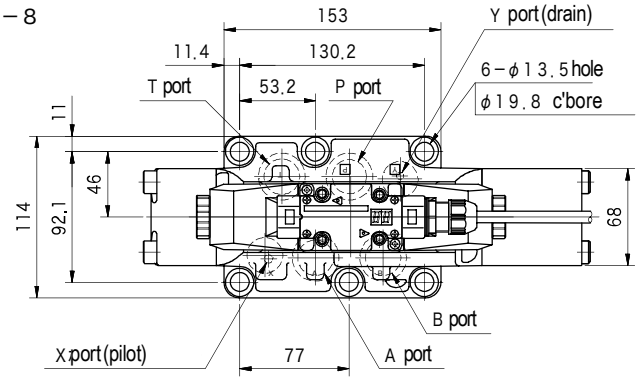


Mounting Dimensions
(ISO 4401－AD－07－4－A)

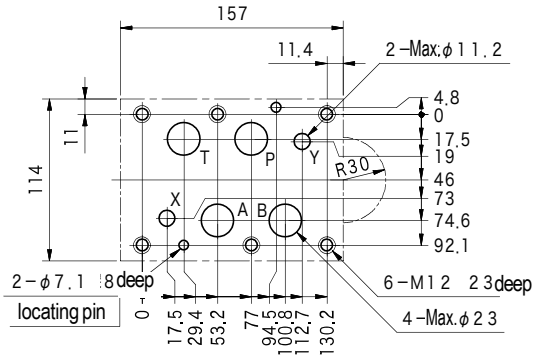


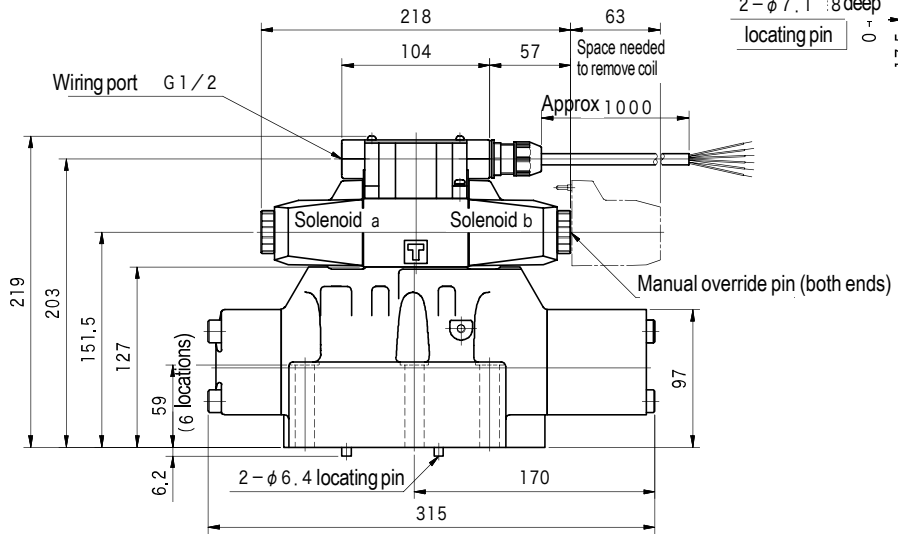


COM－8



Mounting Dimensions
(ISO 4401－AE－08－4－A)

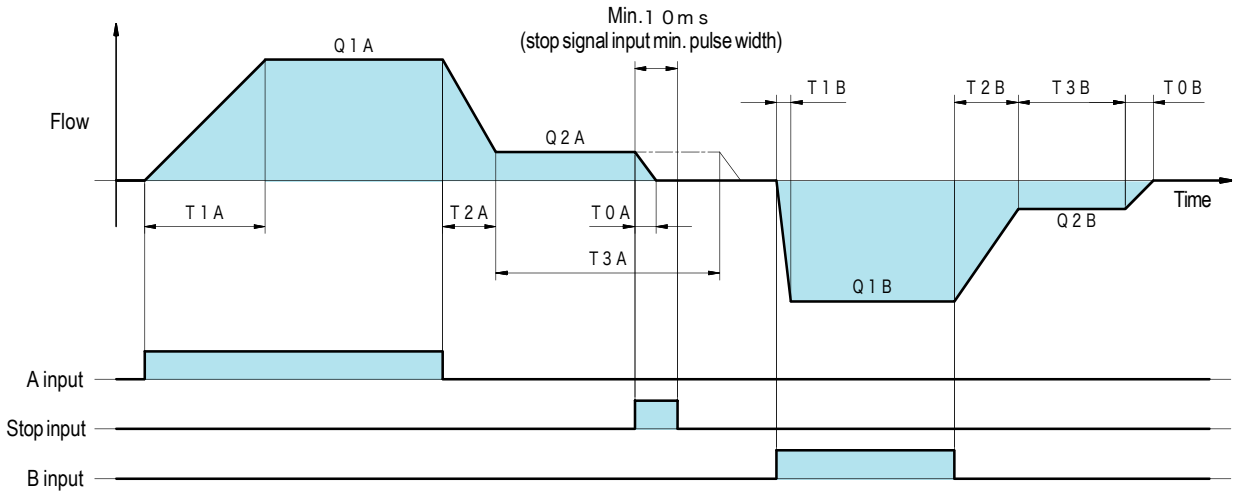




Shockless (SH) Type

Operation

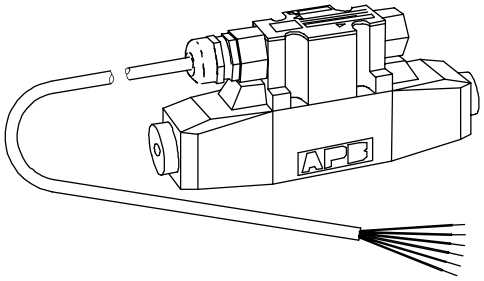
Two-high/low speed-flow levels, high/low speed arrival times, and low speed flow hold time can be independently set for solenoids "a" and "b". Shockless operation and speed control (flow control) can be easily obtained by selecting the A (solenoid 'a') or B (solenoid 'b') direction with the contact point signals of the sequencer. Also positioning control can be obtained by using the stop signal (HALT). (When the energize signal to the solenoid is cut, mode automatically switches to low speed.)



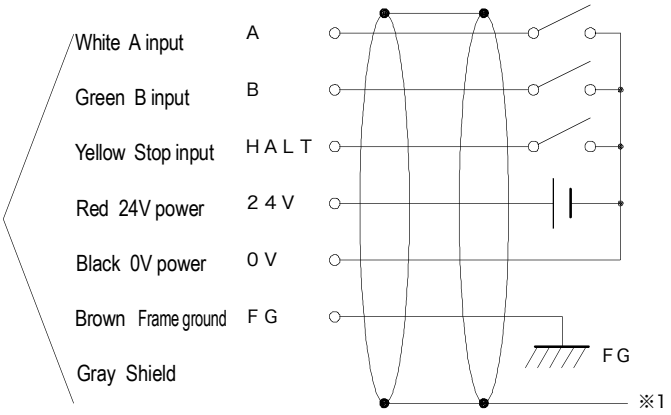
T0A~T3A, T0B~T3B setting range 0~9.9 sec. Q1A, Q2A, Q1B, Q2B setting range 0~100%

If stop (HALT) signal is input, COMNICA valve will stop according to deceleration time TOA or TOB setting.

Wiring (Example)



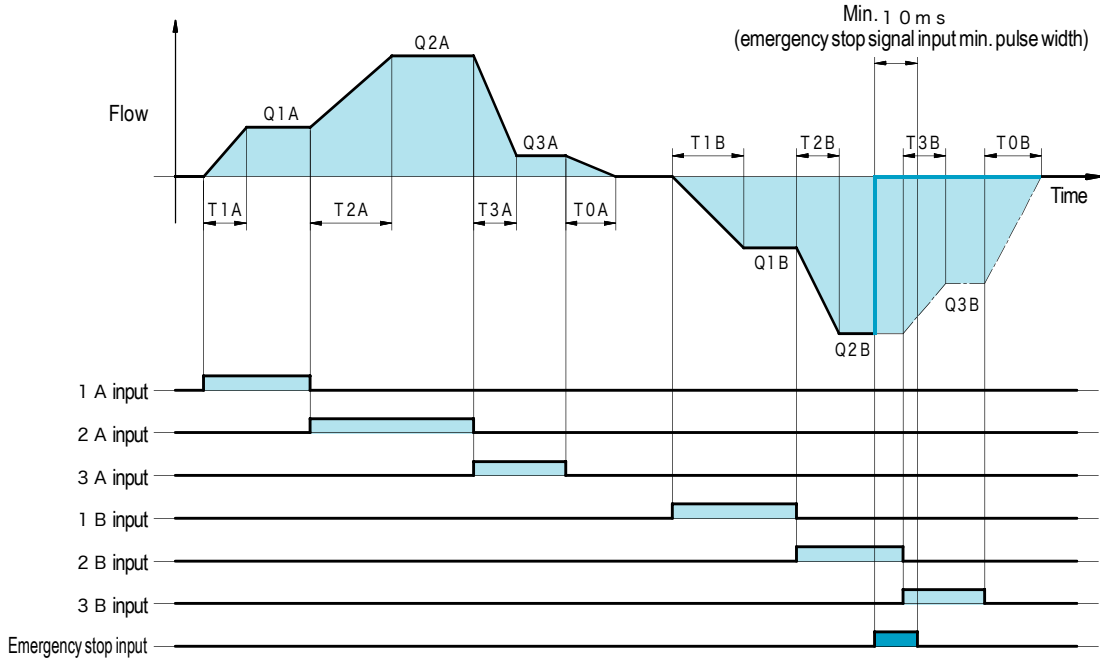
Color Wire Function Nomenclature



※1 When using shielded cable, connect shielded cable to FG (ground) or to 0V.

Operation

Three flow levels - high speed, medium speed, low speed - and arrival times for solenoids “a” and “b” can be independently set. Valve can be directly connected to sequencers, general-purpose relays, proximity switches, etc., to provide simple management of shockless operation, speed control (flow control) and positioning.



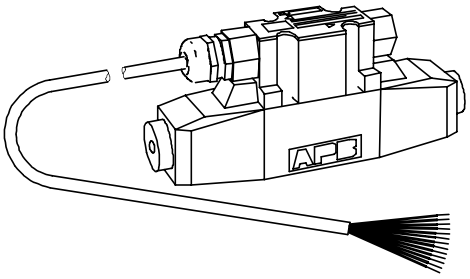
T0A～T3A, T0B～T3B setting range0～9.9 sec. Q1A～Q3A, Q1B～Q3B setting range0～100%

Input of emergency stop signal, will immediately generate zero output from amp to valve regardless of whether there are other contact point input signals and valve returns to neutral position and zero flow. Valve return time to neutral position will be the minimum time of the valve regardless of the TOA and TOB setting times.

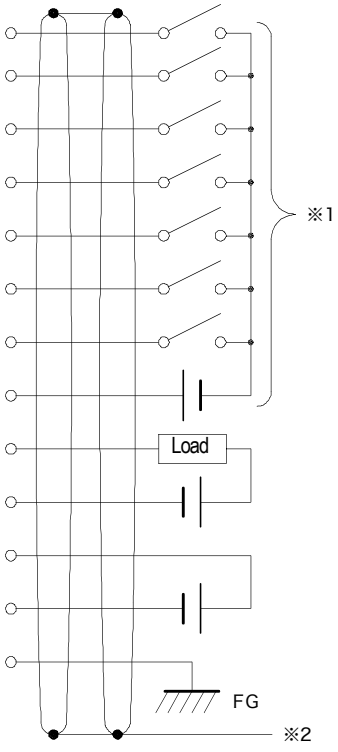
Operational output signal will be ON (contact point closed) when controller is operating normally and OFF (contact point open) under abnormal conditions and during data setting. Operational condition can be viewed with the monitor.

Wiring (Example)

Sink method



Wire Color	Function	Abbreviation
White-red dot	1 A input	1 A
White-black dot	2 A input	2 A
Yellow-red dot	3 A input	3 A
Yellow-black dot	1 B input	1 B
Pink-red dot	2 B input	2 B
Pink-black dot	3 B input	3 B
Orange-red dot	Emer. stop input	STOP
Orange-black dot	Input common	COM
Gray-red dot	Oper. OK output +	READY+
Gray-black dot	Oper. OK output -	READY−
Red	24V power	24V
Black	0V power	0V
Orange-red 2 dot	Frame ground	FG
Gray	Shield	

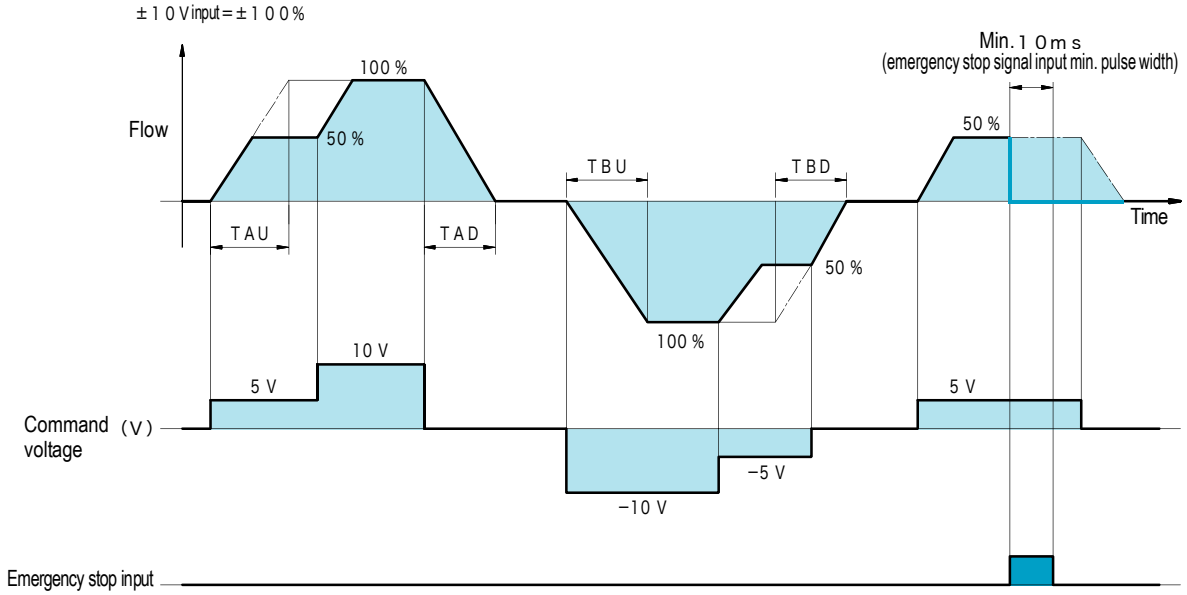


*1 Source method wiring possible. Reverse polarity of input common for source method.
*2 When using shielded cables, connect shield cable to FG (ground earth) or OV.

Analog Input (AN)Type

Operation

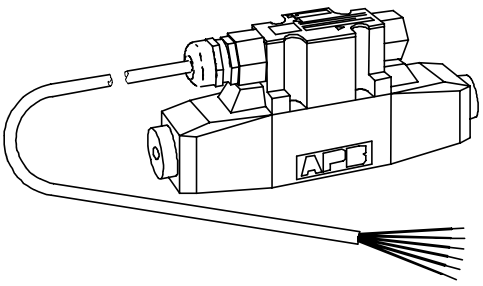
Operation is based on direction of analog voltage polarity with absolute values specified for flow. By setting lag time in advance, ramping can be achieved in response to step input. Lag time is set by arrival time against max. flow. 'A' direction ramp up time (TAU), ramp down time (TAD), 'B' direction ramp up time (TBU) and ramp down time (TBD) can be set separately.

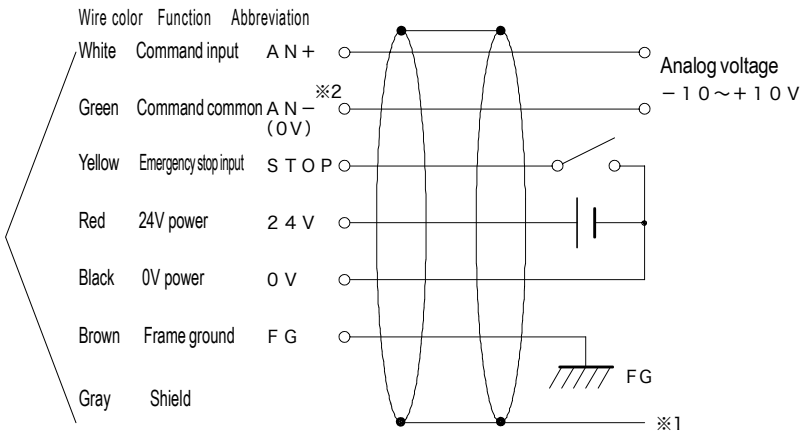


TAU, TAD, TBU, TBD settingrange 0～9.9sec. Flow setting range 0～100%

Input of emergency stop signal, will immediately generate zero output from amp to valve regardless of command voltage and valve returns to neutral position with zero flow. Time of valve return to neutral position will be the minimum time of the valve regardless of the TAD and TBD setting times.

Wiring (Example)



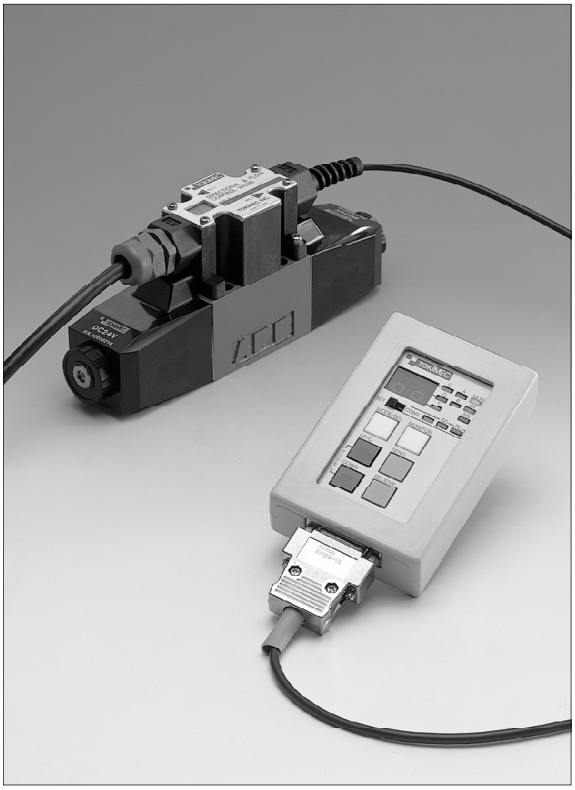


※1 PWhen using shielded cable, connect shielded cable to FG (ground) or 0V.
※2 Q Command signal common AN- is connected internally to 0V power.

Options

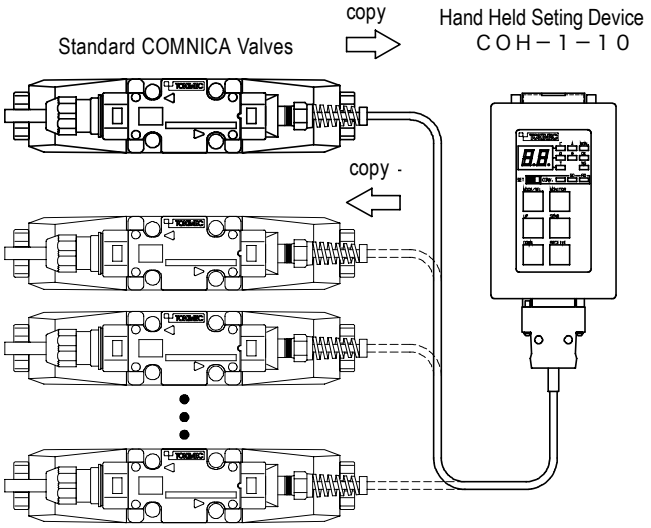
Handheld Setting Device

Model: COH-1-10 (for all COMNICA valves)

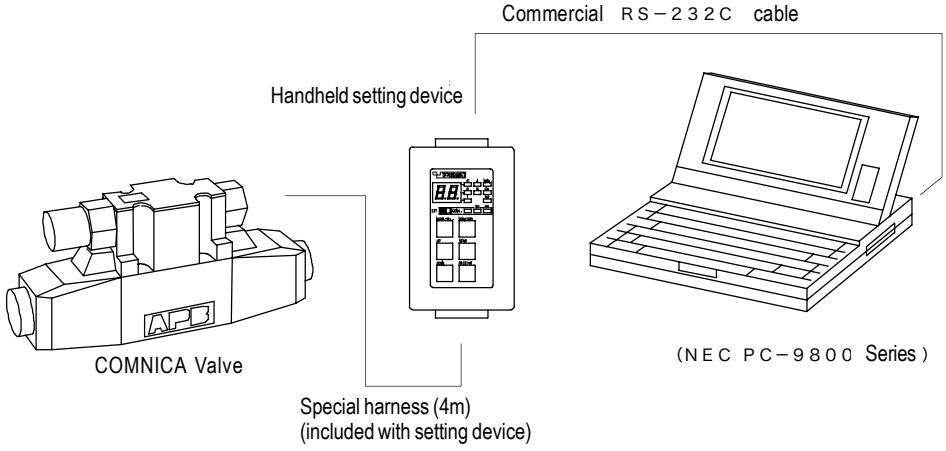


• Handheld setting device allows easy data setting of COMNICA valves in difficult locations.
• Contact point signal name and flow setting values selected during operation can monitored similar as with the valve display.

• COMNICA valve basic data can be copied to the handheld setting device and copied into other COMNICA valves enabling same settings for multiple valves.



• In addition as shown in the illustration at right, the device can also be used as a converter when a PC is used to set data for the COMNICA valve. As a result, by using a PC, various adjustment values can be copied to multiple COMNICA valves as settings. (integrated RS-232C/422 converter function)



Mounting Bolts (JIS B1176,Strength Class 12.9)

Valve Modela	Hex Socket Bolts	Quantity
COM-3	M5×50	4
COM-5	M6×40	4
COM-7	M10×60	4
	M6×55	2
COM-8	M12×80	6

- Mounting bolts must be ordered separately.
- Bolt tightening torque

M5 : 7～8 N·m
M6 : 9～14 N·m
M10 : 50～60 N·m
M12 : 75～81 N·m

Subplate

COM-3/5

Valve Model	Subplate Model	Port Dia. Rc	Porting
COM-3	DGMS-3-1E-10-T-JA-J	3/8	Side
	DGVM-3-10-T-JA-J		Rear
COM-5	DGSM-01X-10-JA-M	3/8	Rear
	DGSM-01Y-10-JA-M	1/2	

COM-7/8

Valve Model	Subplate Model	Port Dia. Rc	
		P, T, A, B	X, Y
COM-7	DGSMV-04-10	1/2	1/4
	DGSMV-04X-10	3/4	
COM-8	DGSMV-06-10	3/4	1/4
	DGSMV-06X-10	1	

- Subplate must be ordered separately.
- See page Q6, Q8 for dimensions.
- See page Q8 for multiple valve mount subplates.
- COM-3/5 mounting bolts must be ordered separately. COM-7/8 subplates are supplied with hex socket bolts for mounting.
- Max. working pressure 21 MPa. For higher pressures, valve should be mounted on manifold block.

Construction

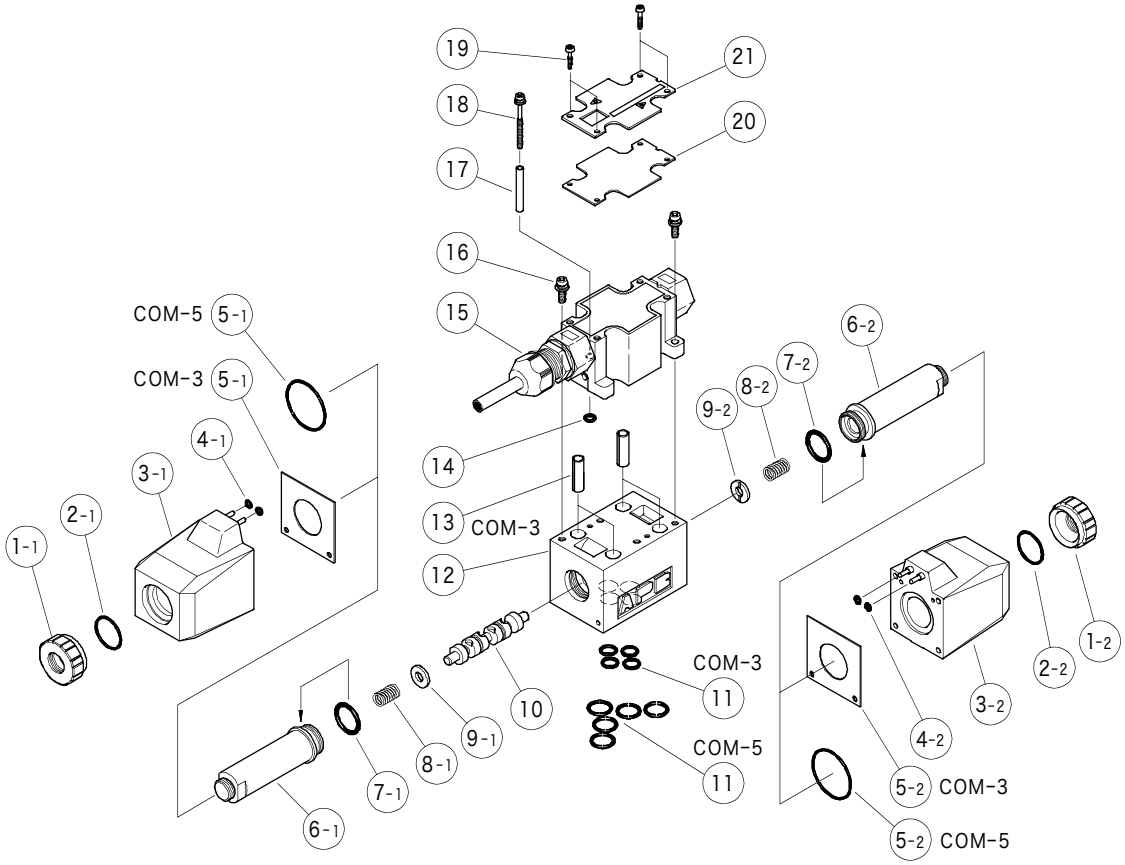
O-Rings COM-3

No.	Part No.	Standard	Qty
2	008001917	JIS B 2401 1A-P21	2
4	008000217	JIS B 2401 1A-P4	4
7	007911429	AS568-114 (FKM, Hs90)	2
11	007901219	AS568-012 (NBR, Hs90)	4
14	007900817	AS568-008 (NBR, Hs70)	1

O-Rings COM-5

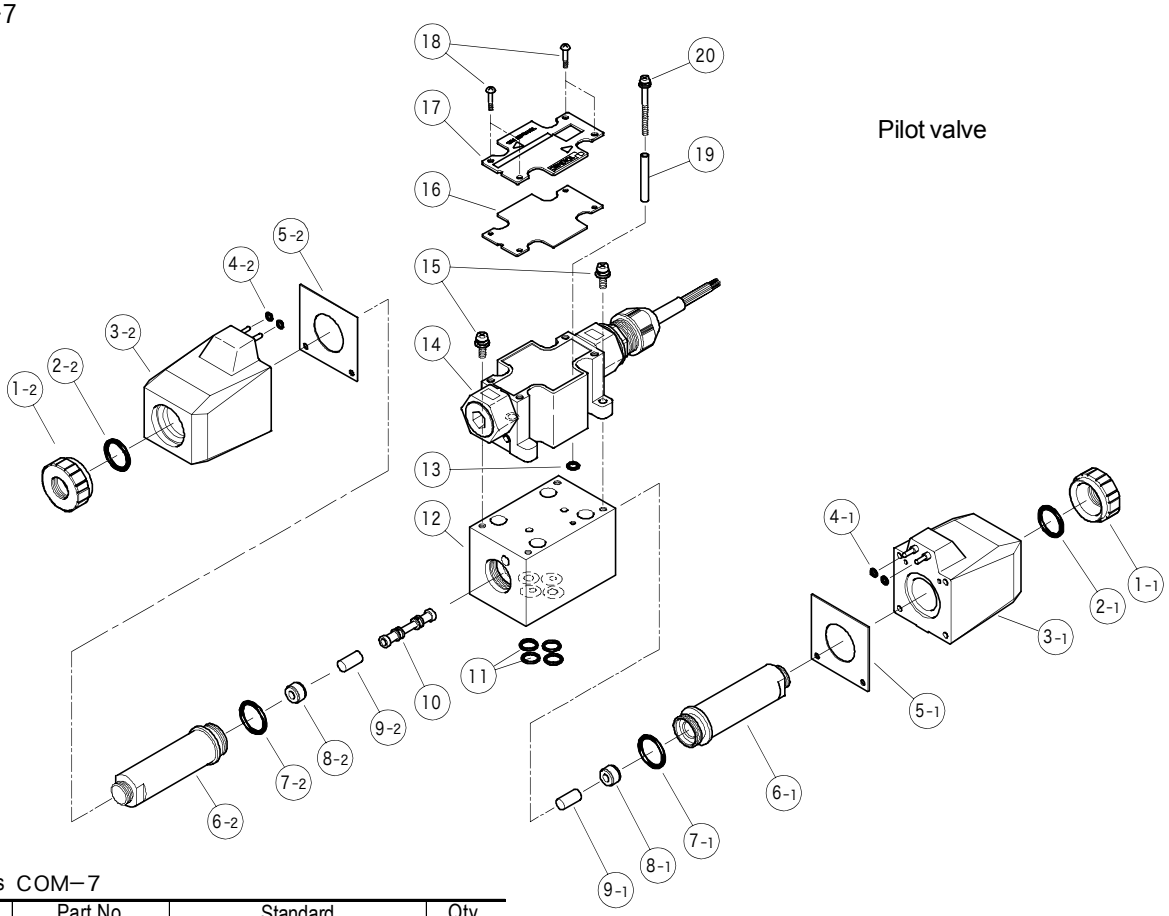
No.	Part No.	Standard	Qty
2	007912117	AS568-121 (NBR, Hs70)	2
4	008000217	JIS B 2401 1A-P4	4
5	007902617	AS568-026 (NBR, Hs70)	2
7	007911729	AS568-117 (FKM, Hs90)	2
11	007901419	AS568-014 (NBR, Hs90)	5
14	007900817	AS568-008 (NBR, Hs70)	3

COM-3/5



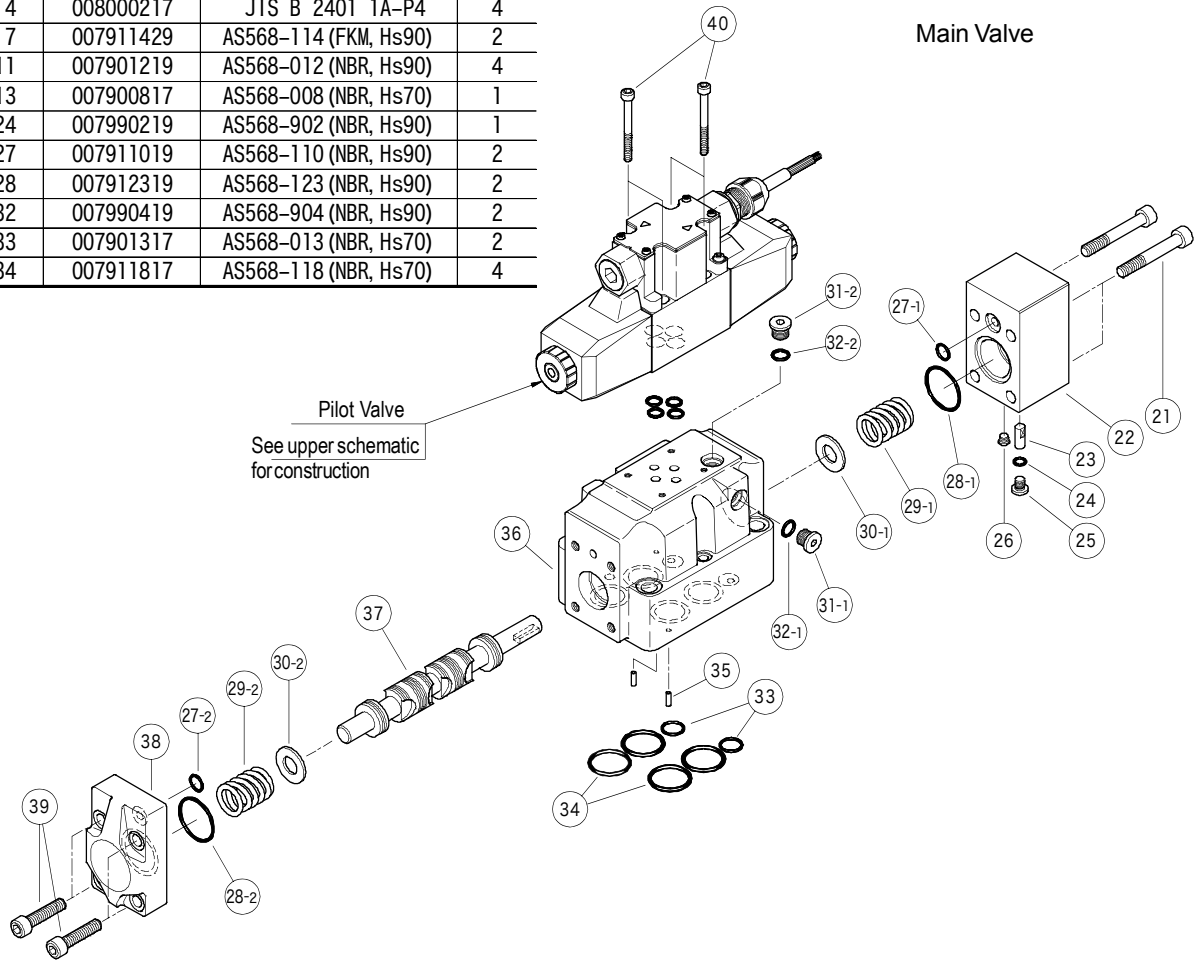
Construction

COM-7



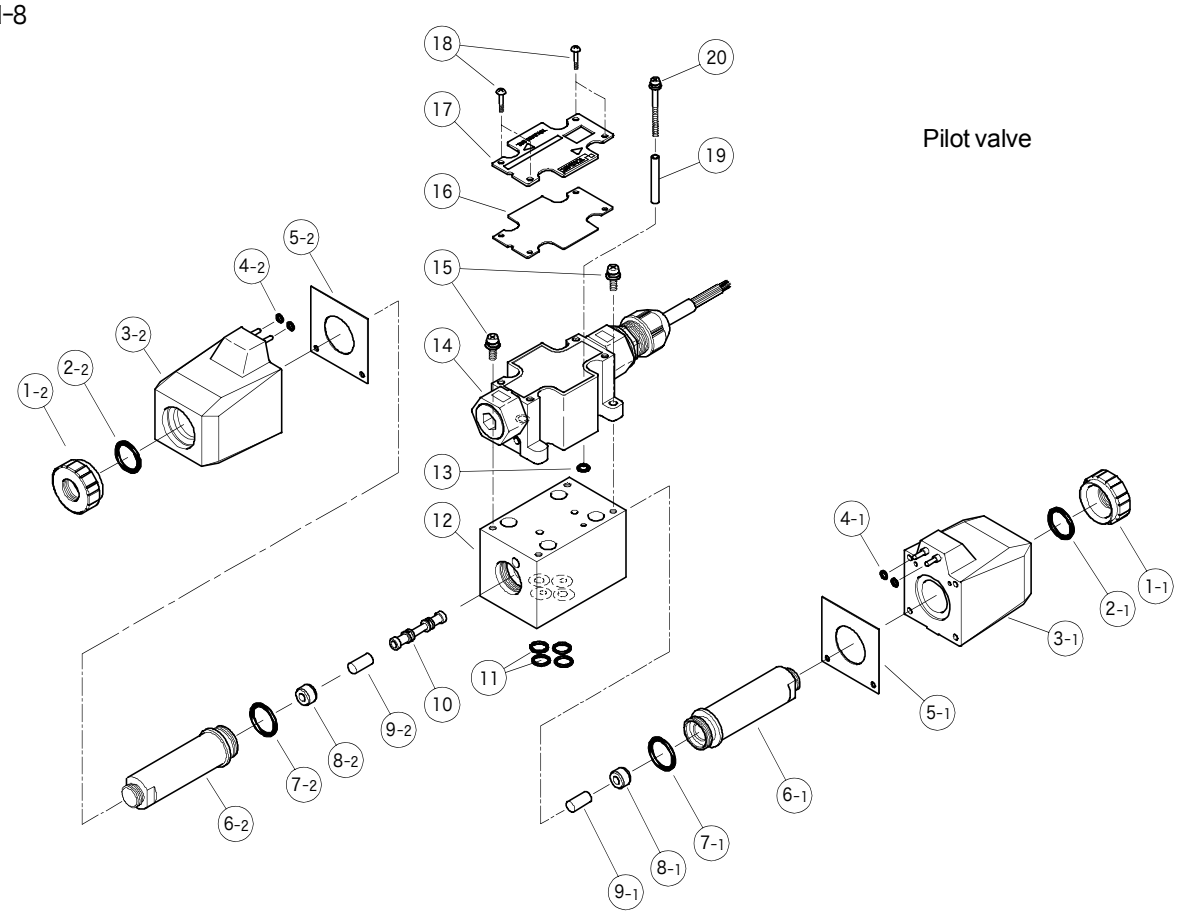
O-Rings COM−7

No.	Part No.	Standard	Qty
2	008001917	JIS B 2401 1A-P21	2
4	008000217	JIS B 2401 1A-P4	4
7	007911429	AS568-114 (FKM, Hs90)	2
11	007901219	AS568-012 (NBR, Hs90)	4
13	007900817	AS568-008 (NBR, Hs70)	1
24	007990219	AS568-902 (NBR, Hs90)	1
27	007911019	AS568-110 (NBR, Hs90)	2
28	007912319	AS568-123 (NBR, Hs90)	2
32	007990419	AS568-904 (NBR, Hs90)	2
33	007901317	AS568-013 (NBR, Hs70)	2
34	007911817	AS568-118 (NBR, Hs70)	4



Construction

COM-8



O-Rings COM-8

No.	Part No.	Standard	Qty
2	008001917	JIS B 2401 1A-P21	2
4	008000217	JIS B 2401 1A-P4	4
7	007911429	AS568-114 (FKM, Hs90)	2
11	007901219	AS568-012 (NBR, Hs90)	4
13	007900817	AS568-008 (NBR, Hs70)	1
24	007990219	AS568-902 (NBR, Hs90)	1
28	007922417	AS568-224 (NBR, Hs70)	2
33	007921017	AS568-210 (NBR, Hs70)	2
34	007921517	AS568-215 (NBR, Hs70)	4