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 also available for same setting operation as valve mounted type.

Model Code

**COM-3/5 Series**

(F11)-COM-3-2C-30-CH-(C)-(H)-11-(S4)

- 1: Hydraulic fluid
  - Omit: mineral oil
- 2: COMNICA valve
- 3: Mounting dimensions
  - 3: ISO 4401-03
  - 5: ISO 4401-05
  - 7: ISO 4401-07
  - 8: ISO 4401-08
- 4: Spool type
  - Refer to "Spool type".
- 5: Spool/spring arrangement
  - C: Spring centered (3 position)
- 6: Max. control flow
  - Refer to "Specifications".
- 7: Control or wiring
  - SH: Shockless
  - CH: 3 Channel setting
  - AN: Analog input
  - U: DIN 43650 connector, Pg.11 (COM-3/52/7/8)
  - KU: Lead wire system (lead wire length: 350 mm)

**COM-52/7/8 Series**

(F11)-COM-7-2C-130-CH-(C)-(H)-(E)-(T)-10-(S4)

- 1: Connection system (control systems SH, CH and AN)
  - Omit: 1-meter harness
  - C: 1-meter harness with connector
  - RC: Receptacle connector
- 8: Solenoid supply voltage (wiring systems U and KU)
  - Omit: control function provided (omitted for systems SH, CH and AN)
  - G: DC 12 V
  - H: DC 24 V
- 9: Pilot (COM-3/52/7/8)
  - Omit: internal pilot
  - E: External pilot
- 10: Drain (COM-3/52/7/8)
  - Omit: external drain
  - T: Internal drain
- 11: Design no.
  - 10: COM-5, COM-52, COM-7 and COM-8
  - 11: COM-3
- 12: Special feature (consult Tokyo Keiki for details.)
  - S4: Meter-out spool with spool opening ratio of 3 : 2 for P side : T side

Note: No control function is provided for U or KU type.

Use the PD3 controller (see page E17-1) or the COM-AMP (see page E16-15).

TOKYO KEIKI INC.
# Specifications

<table>
<thead>
<tr>
<th>Control Function</th>
<th>Connection System</th>
<th>Contact Inputs</th>
<th>Analog Inputs</th>
<th>Contact Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>SH type (Shockless)</td>
<td>Omitted C type</td>
<td>3 contacts, internal common and sink wiring supported</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>RC type</td>
<td>3 contacts, external common (bidirectional photo-coupler insulation), sink wiring/source wiring supported</td>
<td>—</td>
<td>1 contact, external common (bidirectional photo-coupler insulation)</td>
</tr>
<tr>
<td>CH type</td>
<td>—</td>
<td>7 contacts, external common (bidirectional photo-coupler insulation), sink wiring/source wiring supported</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>AN type</td>
<td>Omitted C type</td>
<td>1 contact, internal common and sink wiring supported</td>
<td>1 contact, DC 0V to ±10V (command 0V and power 0V voltages connected internally)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>RC type</td>
<td>1 contact, external common (bidirectional photo-coupler insulation)</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

- Contact point input ON: input common ↔ voltage between contact point input, DC 15 V to 35 V
- Contact point input OFF: input common ↔ voltage between contact point input, DC 0 V to 3 V
- Contact point output: max. load current 50 mA
* All contact signal except for AN type DC±10 V signal.
* The analog input voltage of the AN type is the voltage referenced to the command 0V. Furthermore, the command 0V voltage is connected internally to the power 0 V voltage.

## Spool Types

<table>
<thead>
<tr>
<th>Spool Center Position</th>
<th>Functional Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Closed center</td>
</tr>
<tr>
<td>33</td>
<td>A-B-T connected w/restrictors</td>
</tr>
</tbody>
</table>

---

**Note:**

1. When supply pressure is 6.9 MPa
2. When valve differential pressure is 1 MPa
3. During 0%→100% operation
4. When a control function is provided

**Spool Types**

<table>
<thead>
<tr>
<th>Spool Center Position</th>
<th>Functional Symbol</th>
<th>COM-3/5</th>
<th>COM-52/7/8</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Closed center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>A-B-T connected w/restrictors</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Characteristics Curve (viscosity 20 mm²/s, specific gravity 0.87) (typical examples)

COM-3 (characteristics applicable in the case of the COM-3-2C-30-AN-11)

**Input Voltage - Flow Characteristics**

Supply pressure (6.9 MPa)

![Graph showing Input Voltage - Flow Characteristics for COM-3](image)

**Supply Pressure - Flow Characteristics**

Supply pressure (6.9 MPa)

![Graph showing Supply Pressure - Flow Characteristics for COM-3](image)

COM-5 (characteristics applicable in the case of the COM-5-2C-70-AN-10)

**Input Voltage - Flow Characteristics**

Supply pressure (6.9 MPa)

![Graph showing Input Voltage - Flow Characteristics for COM-5](image)

**Supply Pressure - Flow Characteristics**

Supply pressure (6.9 MPa)

![Graph showing Supply Pressure - Flow Characteristics for COM-5](image)

COM-52 (characteristics applicable in the case of the COM-52-2C-80-AN-10)

**Input Voltage - Flow Characteristics**

Supply pressure (2.1 MPa)

![Graph showing Input Voltage - Flow Characteristics for COM-52](image)

**Supply Pressure - Flow Characteristics**

Supply pressure (2.1 MPa)

![Graph showing Supply Pressure - Flow Characteristics for COM-52](image)
Characteristics Curve (viscosity 20 mm²/s, specific gravity 0.87) (typical examples)

COM-7 (characteristics applicable in the case of the COM-7-2C-130-AN-10)

**Input Voltage - Flow Characteristics**

**Supply Pressure - Flow Characteristics**

Supply pressure (21 MPa)

---

COM-8 (characteristics applicable in the case of the COM-3-2C-250-AN-10)

**Input Voltage - Flow Characteristics**

**Supply Pressure - Flow Characteristics**

Supply pressure (21 MPa)
Notes on Operation

1. Mounting orientation
   Mount valves so spool axis is horizontal.

2. T port
   Prevent pressure surges above 13.7 MPa (24.5 MPa for external drain) from being generated in T port. Ensure that valve is always 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, ensure that cables are heat and oil resistant and of proper size as described below:
   - Power supply (24V or 0V) AWG18 or above 0.75 mm²
   - Contact point signal or analog input AWG22 or above 0.3 mm²

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 (I) = (contact point input voltage –1)/15000
   Operation output (CH type only) max. load current is 50 mA 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
   For manual switching, push the manual override pin. Be aware that actuation force increases with higher back pressure.

7. Waterproof, dustproof
   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 to 0.53 N·m

8. Chattering may arise when these valves are used in combination with the pilot check valves. In cases like this, use the external drain type of pilot check valves.

9. 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

<table>
<thead>
<tr>
<th>i) Valve position</th>
<th>Flow variation: L/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solenoid a Energized</td>
<td>Solenoid b Energized</td>
</tr>
<tr>
<td>47</td>
<td>0.50</td>
</tr>
<tr>
<td>57</td>
<td>0.20</td>
</tr>
<tr>
<td>97</td>
<td>0.10</td>
</tr>
<tr>
<td>147</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Example 2: COM-5

<table>
<thead>
<tr>
<th>i) Valve position</th>
<th>Flow variation: L/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solenoid a Energized</td>
<td>Solenoid b Energized</td>
</tr>
<tr>
<td>70</td>
<td>1.40</td>
</tr>
<tr>
<td>80</td>
<td>0.65</td>
</tr>
<tr>
<td>120</td>
<td>0.30</td>
</tr>
<tr>
<td>170</td>
<td>0.10</td>
</tr>
</tbody>
</table>

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

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

Notes regarding the above examples.
- Values may differ according to the orientation of electromagnetic fields and the electrical wiring shown in the illustration.
- 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 Tokyo Keiki for details.

TOKYO KEIKI INC.
Directional Control Valves

COM-3

A port  T port

4-φ5.5 hole

P port  40.5 16.8  B port

63

47

Solenoid a  Solenoid b

For solenoid removal

74 72

Note: When an adapter plug is provided, refer to page E16-10 for the connection area.

COM-3-KU

A port  T port

P port  218  B port

218

76 92

63

Solenoid a  Solenoid b

Lead wire AVX wire (0.85 mm²)

Mounting dimensions

4-M5, 14 deep

4-φ7.5 (max.)

Note: When an adapter plug is provided, refer to page E16-10 for the connection area.
Dimensions

COM-3-U

DIN43650 connector
Wiring connection port Pg.11
Applicable cable diameter φ6 to 9

COM-5

Mounting dimensions

4-M6, 14 deep (recommended)

Note: When an adapter plug is provided, refer to page E16-10 for the connection area.
**Dimensions**

**COM-5-KU**

![Diagram of COM-5-KU]

**COM-5-2**

![Diagram of COM-5-2]

**Mounting dimensions**

![Mounting dimensions diagram]

Note:
- When an adapter plug is provided, refer to page E16-10 for the connection area.
- Consult Tokyo Keiki for the outline drawings of the U and KU types.
Dimensions

Directional Control Valves

Solenoid a Solenoid b

Approx. 1000

Manual override pin (both ends)

Note:

• When an adapter plug is provided, refer to page E16-10 for the connection areas.
• Consult Tokyo Keiki for the outline drawings of the U and KU types.
### Dimensions

**COM-3/52/7/8-C**  
Approx. 1000

**COM-3/52/7/8-RC**

**COM-5-C**  
Approx. 1000

**COM-5-RC**

---

**Special Harness**

- This harness is connected to the -RC type.
- An input common pin is available and, therefore, both sink wiring and source wiring are supported.

**COM-H-CH-RC-1000-10**

1. Harness specially designed for COM series  
2. CH: For CH type  
   SH: For SH type  
   AN: For AN type  
3. Specially designed with receptacle (RC type)  
4. Harness length (unit: mm)  
   1000, 2000, 3000, 4000, 5000  
5. Design no.

### Notes:
- The inter-fitting position of the -RC type differs depending on the individual valve. Do not use the L-type plug.
- A contact input common pin is provided on the SH type and AN type of the -RC type.

### Dimensions

**COM-3/52/7/8-C**

**COM-3/52/7/8-RC**

**COM-5-C**

**COM-5-RC**

---

**Note:**
- The inter-fitting position of the –RC type differs depending on the individual valve. Do not use the L-type plug.
- A contact input common pin is provided on the SH type and AN type of the –RC type.

---

**Receptacle Pin No.**

<table>
<thead>
<tr>
<th>Receptacle Pin No.</th>
<th>Wire Color</th>
<th>CH Type</th>
<th>SH Type</th>
<th>AN Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Red</td>
<td>Power DC24V</td>
<td>Power DC24V</td>
<td>Power DC24V</td>
</tr>
<tr>
<td>2</td>
<td>Black</td>
<td>Power 0V</td>
<td>Power 0V</td>
<td>Power 0V*</td>
</tr>
<tr>
<td>3</td>
<td>White – Red</td>
<td>1A input</td>
<td>A input</td>
<td>Command input</td>
</tr>
<tr>
<td>4</td>
<td>White – Black</td>
<td>2A input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Yellow – Red</td>
<td>3A input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Yellow – Black</td>
<td>1B input</td>
<td>B input</td>
<td>Command 0V*</td>
</tr>
<tr>
<td>7</td>
<td>Pink – Red</td>
<td>2B input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Pink – Black</td>
<td>3B input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Orange – Red</td>
<td>Emergency stop input</td>
<td>Stop input</td>
<td>Emergency stop input</td>
</tr>
<tr>
<td>10</td>
<td>Orange – Black</td>
<td>Contact input common</td>
<td>Contact input common</td>
<td>Contact input common</td>
</tr>
<tr>
<td>11</td>
<td>Grey – Red</td>
<td>Operation enable output +</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Grey – Black</td>
<td>Operation enable output –</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Orange – Red</td>
<td>Chassis ground</td>
<td>Chassis ground</td>
<td>Chassis ground</td>
</tr>
<tr>
<td>14</td>
<td>Grey</td>
<td>Shield</td>
<td>Shield</td>
<td>Shield</td>
</tr>
</tbody>
</table>

*The command 0V and power 0V voltages are shorted inside the valve.*

---

**TOKYO KEIJI INC.**
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 PLC. 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.)

If stop (HALT) signal is input, COMNICA valve will stop according to deceleration time T0A or T0B setting.

Electrical Wiring Examples

1-meter harness type

- Wire color:
  - White: A input
  - Green: B input
  - Yellow: Stop input
  - Red: Power 24V
  - Black: Power 0V
  - Brown: Chassis ground
  - Grey: Shield
- Function:
  - FG: Frame ground

1-meter harness type with connector

- Pin no.: 3
  - Function: A input
  - Abbr.: A
- Pin no.: 6
  - Function: B input
  - Abbr.: B
- Pin no.: 9
  - Function: Stop input
  - Abbr.: HALT

Receptacle connector type

- Pin no.: 3
  - Function: A input
  - Abbr.: A
- Pin no.: 6
  - Function: B input
  - Abbr.: B
- Pin no.: 9
  - Function: Stop input
  - Abbr.: HALT
- Pin no.: 10
  - Function: Input common
  - Abbr.: COM

*1 When using shielded cables, connect shield cable to FG (ground earth) or 0V.
*2 Only the sink connection is supported.
3 Channel Setting (CH) Type

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 PLC, general-purpose relays, proximity switches, etc., to provide simple management of shockless operation, speed control (flow control) and positioning.

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. Time of valve return to neutral position will be the minimum time of the valve regardless of the T0A and T0B 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.

Electrical Wiring Examples

1-meter harness type

*1 When using shielded cables, connect shield cable to FG (ground earth) or 0V.

*2 Both the sink connection and source connection are supported.

Receptacle connector type

*1 When using shielded cables, connect shield cable to FG (ground earth) or 0V.

*2 Both the sink connection and source connection are supported.
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.

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.

Electrical Wiring Examples

1-meter harness type

- **Wire color**
  - White: Command inputs
  - Green: Command 0V
  - Yellow: Emergency stop input
  - Red: Power 24V
  - Black: Power 0V
  - Brown: Chassis ground
  - Grey: Shield

- **Function**
  - DC-10V~+10V

- **Abbr.**
  - 3

- **10V input = ±100%**

- **-10V**

- **5V**

- **Time**

- **Flow**

- TAU, TAD, TBU, TBD setting range 0 to 9.9 sec.

- **Flow setting range** 0 to 100%

- **Command voltage (V)**

- **5V**

- **10V**

- **-5V**

- **-10V**

- **TAU**

- **TAD**

- **TBU**

- **TBD**

- **50%**

- **100%**

1-meter harness type with connector

- **Pin no.**
  - 3: Command inputs
  - 6: Command 0V
  - 9: Emergency stop input
  - 1: Power 24V
  - 2: Power 0V
  - 13: Chassis ground
  - 14: Shield

- **Function**
  - DC-10V~+10V

- **Abbr.**
  - 3

- **FG**

- **Min. 10 ms**
  - (emergency stop signal input min. pulse width)

- **A**

- **B**

- **3"**

- **2"**

- **1"**

- **10V input = ±100%**

- **5V**

- **10V**

- **-5V**

- **-10V**

- **100%**

- **50%**

- **Time**

- **Flow**

- **TAU, TAD, TBU, TBD setting range 0 to 9.9 sec.**

- **Flow setting range 0 to 100%**

- **Command voltage (V)**

- **5V**

- **10V**

- **-5V**

- **-10V**

- **TAU**

- **TAD**

- **TBU**

- **TBD**

- **50%**

- **100%**

- **Time**

- **Flow**

- **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.**

- **TOKYO KEIKI INC.**
Controller Unit Nomenclature and Functions

Options

Handheld Setting Device
Model code: 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.
Options

These separate controllers are used to drive the U and KU types. The control system, wiring and other characteristics are the same as for the installed controllers.

COM-AMP-3-CH-H-11

1. COMNICA valve separate controller
2. Compatible valves
   - 3: For COM-3
   - 5: For COM-5
   - 52: For COM-52
   - 7: For COM-7
   - 8: For COM-8
3. Control
   - SH: Shockless
   - CH: 3 Channel setting
   - AN: Analog input
4. Supply voltage
   - H: DC24V
   - G: DC12V
5. Design no.

<table>
<thead>
<tr>
<th>Model Code</th>
<th>COM-AMP-?-?-G-11</th>
<th>COM-AMP-?-?-H-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable solenoid coil</td>
<td>For DC12V</td>
<td>For DC24V</td>
</tr>
<tr>
<td>Power supply</td>
<td>Voltage DC10.8 to 14V</td>
<td>Voltage DC21.6 to 28V</td>
</tr>
<tr>
<td></td>
<td>Current 1.8A or higher</td>
<td>Current 1.8A or higher</td>
</tr>
<tr>
<td>Max. power consumption</td>
<td>22W</td>
<td>48W</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>0～60°C</td>
<td></td>
</tr>
<tr>
<td>Relative humidity</td>
<td>40～70%</td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-10～60°C</td>
<td></td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>45m/s² (JIS D 1601)</td>
<td></td>
</tr>
<tr>
<td>Shock resistance</td>
<td>150m/s² (JIS C 0041)</td>
<td></td>
</tr>
<tr>
<td>Waterproof, dustproof</td>
<td>IP20</td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>Conforming to RS-422</td>
<td></td>
</tr>
<tr>
<td>Wiring specifications</td>
<td>1-meter harness provided</td>
<td>Electrical Wiring Examples</td>
</tr>
<tr>
<td>I/O</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Controller mounting dimensions

Method of connecting the wires between the controller and valve body

TOKYO KEIKI INC.
### Mounting Bolts (JIS B 1176, Strength Class 12.9)

<table>
<thead>
<tr>
<th>Valve Model</th>
<th>Hex Socket Bolts</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM-3</td>
<td>M5 × 50</td>
<td>4</td>
</tr>
<tr>
<td>COM-5, COM-52</td>
<td>M6 × 40</td>
<td>4</td>
</tr>
<tr>
<td>COM-7</td>
<td>M10 × 60</td>
<td>4</td>
</tr>
<tr>
<td>COM-8</td>
<td>M12 × 80</td>
<td>6</td>
</tr>
</tbody>
</table>

- Mounting bolts must be ordered separately.
- Tightening torque of mounting bolts
  - M5: 7 to 8 N·m
  - M6: 9 to 14 N·m
  - M10: 50 to 60 N·m
  - M12: 75 to 81 N·m

### Subplate

#### COM-3/5

<table>
<thead>
<tr>
<th>Valve Model</th>
<th>Subplate</th>
<th>Connection Port Dia.</th>
<th>Porting</th>
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#### COM-7/8

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- A subplate is not available for the COM-52 model.
- Subplate must be ordered separately.
- See page R6-5 to R6-7 for dimensions.
- COM-3/5 mounting bolts must be ordered separately. COM-7/8 subplates are supplied with hex socket bolts for mounting valve.
- Max. working pressure is 21 MPa. For higher pressures, valve should be mounted on manifold block.

### Construction

#### O-ring COM-3

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#### O-ring COM-5

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**TOKYO KEIKI INC.**
Construction

COM-52

O-ring COM-52

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Construction

COM-7

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Construction

COM-8

O-ring COM-8

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See upper schematic for construction