Combined control & balancing valves for small terminal units
Pressure independent balancing and control valve for modulating control

Engineering GREAT Solutions
TA-Modulator

The new uniquely shaped EQM characteristics provide highly precise temperature control. The valve is compatible with linear proportional or 3-point actuators. A built-in differential pressure controller provides high control authority, control stability and automatic limitation of design flow. Measurement of flow and available pressure enables system optimisation and diagnostics.

Key features

- **Precise temperature control**
  Uniquely shaped EQM characteristic provides an up to 6 times larger operating stroke than linear valves.

- **Quick hydronic balancing**
  Automatic flow limitation when actuator is fully open protects entire system against overflows.

- **Easy troubleshooting**
  Flow and differential pressure measuring helps to reduce pump consumption and provides all necessary data for system diagnostics.

- **High reliability**
  AMETAL® and stainless steel guarantees high corrosion resistance and reduces the risk of leakage.

Technical description

**Application:**
Heating and cooling systems.

**Functions:**
Control (EQM)
Pre-setting (max. flow)
Differential pressure control
Measuring (ΔH, T, q)
Shut-off (for isolation during system maintenance – see also Leakage rate)

**Dimensions:**
DN 15-32

**Pressure class:**
PN 16

**Differential pressure (ΔpV):**
Max. differential pressure (ΔpV_{max}): 400 kPa = 4 bar
Min. differential pressure (ΔpV_{min}): DN 15-20: 15 kPa = 0,15 bar
DN 25-32: 23 kPa = 0,23 bar
(Valid for position 10, fully open. Other positions will require lower differential pressure, check with the software HySelect.)

**Flow range:**
The flow (q_{max}) can be set within the range:
DN 15: 92 - 480 l/h
DN 20: 200 - 975 l/h
DN 25: 340 - 1750 l/h
DN 32: 720 - 3600 l/h
q_{max} = l/h at each setting and fully open valve plug.

**Temperature:**
Max. working temperature: 90°C
Min. working temperature: 0°C

**Media:**
Water or neutral fluids, water-glycol mixtures.

**Lift:**
DN 15-20: 4 mm
DN 25-32: 6,5 mm

**Leakage rate:**
Leakage flow ≤ 0,01% of max. q_{max} (setting 10) and correct flow direction. (Class IV according to EN 60534-4).

**Material:**
Valve body: AMETAL®
Valve insert: AMETAL® and PPS
Valve plug: Stainless steel
Spindle: Stainless steel
Spindle seal: EPDM O-ring
Δp insert: PPS
Membrane: EPDM and HNBR
Springs: Stainless steel
O-rings: EPDM

AMETAL® is the dezincification resistant alloy of IMI Hydronic Engineering.

**Marking:**
TA, IMI, PN 16, DN and flow direction arrow.
Grey handwheel and black identification ring on measuring point: TA-Modulator and DN.

**Connection:**
Male thread according to ISO 228.

**Connection to actuator:**
M30x1,5

**Actuators:**
DN 15-20: EMO TM, TA-Slider 160
DN 25-32: TA-Slider 160
See separate information on EMO TM and TA-Slider 160.
Valve characteristics

Nominal valve characteristic for all settings.

![Graph showing valve characteristic]

Measuring accuracy

Maximum flow deviation at different settings

![Graph showing flow deviation]

*) Setting (%) of fully open valve.

Correction factors

The flow calculations are valid for water (+20°C). For other liquids with approximately the same viscosity as water (≤20 cSt = 3*E=100S.U.), it is only necessary to compensate for the specific density. However, at low temperatures, the viscosity increases and laminar flow may occur in the valves. This causes a flow deviation that increases with small valves, low settings and low differential pressures. Correction for this deviation can be made with the software HySelect or directly in our balancing instruments.

Noise

In order to avoid noise in the installation, the valve must be correctly installed and the water de-aerated.
**Actuators**

**Actuator EMO TM and TA-Slider 160**
For more details about EMO TM and TA-Slider 160, see separate catalogue leaflets.

TA-Modulator is developed to work together with the EMO TM and TA-Slider 160 actuators. Actuators of other brands require:

**Working range** (setting 1-10)

- DN 15-20: X (closed - fully open) = 11.6 - 15.85
- DN 25-32: X (closed - fully open) = 10.1 - 16.85

**Closing force**

- DN 15-20: Min. 125 N (max. 500 N)
- DN 25-32: Min. 190 N (max. 500 N)

IMI Hydronic Engineering will not be held responsible for the control function if other brands of actuator are used.

**Max. recommended pressure drop (ΔpV) for valve and actuator combination**

The maximum recommended pressure drop over a valve and actuator combination for close off (ΔpV_{close}) and to fulfill all stated performances (ΔpV_{max}).

<table>
<thead>
<tr>
<th>DN</th>
<th>EMO TM * [kPa]</th>
<th>TA-Slider 160 * [kPa]</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>20</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>25</td>
<td>-</td>
<td>400</td>
</tr>
<tr>
<td>32</td>
<td>-</td>
<td>400</td>
</tr>
</tbody>
</table>

*) Closing force 125 N (EMO TM) and 190 N (TA-Slider 160).

ΔpV_{close} = The maximum pressure drop that the valve can close against from an opened position, with a specified force (actuator) without exceeding stated leakage rate.

ΔpV_{max} = The maximum allowed pressure drop over the valve, to fulfill all stated performances.

**Sizing**

1. Choose the smallest valve size that can obtain the design flow with some safety margin, see "q_{max} values". The setting should be as open as possible.

2. Check that the available ΔpV is within the working range 15-400 kPa or 23-400 kPa.

**q_{max} values**

<table>
<thead>
<tr>
<th>Position</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN 15</td>
<td>92</td>
<td>114</td>
<td>140</td>
<td>170</td>
<td>210</td>
<td>265</td>
<td>325</td>
<td>390</td>
<td>445</td>
<td>480</td>
</tr>
<tr>
<td>DN 20</td>
<td>200</td>
<td>260</td>
<td>360</td>
<td>460</td>
<td>566</td>
<td>670</td>
<td>770</td>
<td>850</td>
<td>920</td>
<td>975</td>
</tr>
<tr>
<td>DN 25</td>
<td>340</td>
<td>440</td>
<td>600</td>
<td>810</td>
<td>1010</td>
<td>1200</td>
<td>1350</td>
<td>1520</td>
<td>1640</td>
<td>1750</td>
</tr>
<tr>
<td>DN 32</td>
<td>720</td>
<td>960</td>
<td>1350</td>
<td>1750</td>
<td>2150</td>
<td>2530</td>
<td>2850</td>
<td>3130</td>
<td>3380</td>
<td>3600</td>
</tr>
</tbody>
</table>

q_{max} = l/h at each setting and fully open valve plug.
Installation

Application example

Installation of actuator

Approx. 15 mm of free space is required above the actuator.

Flow direction

TA-Modulator + EMO TM/TA-Slider 160

<table>
<thead>
<tr>
<th>DN</th>
<th>Required Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-20</td>
<td>107 mm</td>
</tr>
<tr>
<td>25</td>
<td>130 mm</td>
</tr>
<tr>
<td>32</td>
<td>133 mm</td>
</tr>
</tbody>
</table>

IP54
### Operating function

#### Setting

1. Turn the setting wheel to desired value, e.g. 5.0.

#### Shut-off

1. Turn the setting wheel clockwise to X.

#### Measuring $q$

1. Remove any actuator.
2. Connect the IMI TA balancing instrument to the measuring points.
3. Input the valve type, size and setting and the actual flow is displayed.

#### Measuring $\Delta H$

1. Remove any actuator.
2. Close the valve according to “Shut-off”.
3. Bypass the $\Delta p$-part by opening the bypass spindle $\approx$1 turn anticlockwise, with a 5 mm Allen key.
4. Connect the IMI TA balancing instrument to the measuring points and measure.

**Important!** Reopen the valve to previous setting and close the bypass spindle after the measurement is completed.
### Articles

**Male thread**

Threads according to ISO 228

<table>
<thead>
<tr>
<th>DN</th>
<th>D</th>
<th>L</th>
<th>H1</th>
<th>H2</th>
<th>B</th>
<th>(q_{\text{max}}) [l/h]</th>
<th>Kg</th>
<th>EAN</th>
<th>Article No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>G3/4</td>
<td>74</td>
<td>55</td>
<td>55</td>
<td>54</td>
<td>480</td>
<td>0.54</td>
<td>7318794027008</td>
<td>52 164-315</td>
</tr>
<tr>
<td>20</td>
<td>G1</td>
<td>85</td>
<td>64</td>
<td>64</td>
<td>64</td>
<td>975</td>
<td>0.69</td>
<td>7318794027107</td>
<td>52 164-320</td>
</tr>
<tr>
<td>25</td>
<td>G1 1/4</td>
<td>93</td>
<td>64</td>
<td>67</td>
<td>64</td>
<td>1750</td>
<td>0.79</td>
<td>7318794027206</td>
<td>52 164-325</td>
</tr>
<tr>
<td>32</td>
<td>G1 1/2</td>
<td>117</td>
<td>78</td>
<td>70</td>
<td>78</td>
<td>3600</td>
<td>1.5</td>
<td>7318794027305</td>
<td>52 164-332</td>
</tr>
</tbody>
</table>

*) Connection to actuator.

→ = Flow direction

### Connections

**With female thread**

Threads according to ISO 228.

Thread length according to ISO 7-1.

Swivelling nut

<table>
<thead>
<tr>
<th>Valve DN</th>
<th>D</th>
<th>D1</th>
<th>L*</th>
<th>EAN</th>
<th>Article No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>G3/4</td>
<td>G1/2</td>
<td>21</td>
<td>7318794016903</td>
<td>52 163-015</td>
</tr>
<tr>
<td>20</td>
<td>G1</td>
<td>G3/4</td>
<td>23</td>
<td>7318794017009</td>
<td>52 163-020</td>
</tr>
<tr>
<td>25</td>
<td>G1 1/4</td>
<td>G1</td>
<td>23</td>
<td>7318794017108</td>
<td>52 163-025</td>
</tr>
<tr>
<td>32</td>
<td>G1 1/2</td>
<td>G1 1/4</td>
<td>31</td>
<td>7318794017207</td>
<td>52 163-032</td>
</tr>
</tbody>
</table>

**With male thread**

Threads according to ISO 7-1.

Swivelling nut

<table>
<thead>
<tr>
<th>Valve DN</th>
<th>D</th>
<th>D1</th>
<th>L*</th>
<th>EAN</th>
<th>Article No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>G3/4</td>
<td>R1/2</td>
<td>29</td>
<td>4024052516612</td>
<td>0601-02.350</td>
</tr>
<tr>
<td>20</td>
<td>G1</td>
<td>R3/4</td>
<td>32.5</td>
<td>4024052516810</td>
<td>0601-03.350</td>
</tr>
<tr>
<td>25</td>
<td>G1 1/4</td>
<td>R1</td>
<td>35</td>
<td>4024052517015</td>
<td>0601-04.350</td>
</tr>
<tr>
<td>32</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Welding connection**

Swivelling nut

<table>
<thead>
<tr>
<th>Valve DN</th>
<th>D</th>
<th>Pipe DN</th>
<th>L*</th>
<th>EAN</th>
<th>Article No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>G3/4</td>
<td>15</td>
<td>36</td>
<td>7318792748509</td>
<td>52 009-015</td>
</tr>
<tr>
<td>20</td>
<td>G1</td>
<td>20</td>
<td>40</td>
<td>7318792748608</td>
<td>52 009-020</td>
</tr>
<tr>
<td>25</td>
<td>G1 1/4</td>
<td>25</td>
<td>40</td>
<td>7318792748707</td>
<td>52 009-025</td>
</tr>
<tr>
<td>32</td>
<td>G1 1/2</td>
<td>32</td>
<td>40</td>
<td>7318792748806</td>
<td>52 009-032</td>
</tr>
</tbody>
</table>

*) Fitting length (from the gasket surface to the end of the connection).
### Soldering connection

**Swivelling nut**

<table>
<thead>
<tr>
<th>Valve DN</th>
<th>D</th>
<th>Pipe Ø</th>
<th>L*</th>
<th>EAN</th>
<th>Article No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>G3/4</td>
<td>15</td>
<td>13</td>
<td>7318792749038</td>
<td>52 009-515</td>
</tr>
<tr>
<td>15</td>
<td>G3/4</td>
<td>16</td>
<td>13</td>
<td>7318792749407</td>
<td>52 009-516</td>
</tr>
<tr>
<td>20</td>
<td>G1</td>
<td>18</td>
<td>15</td>
<td>7318792749606</td>
<td>52 009-518</td>
</tr>
<tr>
<td>20</td>
<td>G1</td>
<td>22</td>
<td>18</td>
<td>7318792749605</td>
<td>52 009-522</td>
</tr>
<tr>
<td>25</td>
<td>G1 1/4</td>
<td>28</td>
<td>21</td>
<td>7318792749704</td>
<td>52 009-528</td>
</tr>
<tr>
<td>32</td>
<td>G1 1/2</td>
<td>35</td>
<td>26</td>
<td>7318792749803</td>
<td>52 009-535</td>
</tr>
</tbody>
</table>

### Connection with smooth end

For connection with press coupling

**Swivelling nut**

<table>
<thead>
<tr>
<th>Valve DN</th>
<th>D</th>
<th>Pipe Ø</th>
<th>L*</th>
<th>EAN</th>
<th>Article No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>G3/4</td>
<td>15</td>
<td>39</td>
<td>7318793810601</td>
<td>52 009-315</td>
</tr>
<tr>
<td>20</td>
<td>G1</td>
<td>18</td>
<td>44</td>
<td>7318793810700</td>
<td>52 009-318</td>
</tr>
<tr>
<td>20</td>
<td>G1</td>
<td>22</td>
<td>48</td>
<td>7318793810809</td>
<td>52 009-322</td>
</tr>
<tr>
<td>25</td>
<td>G1 1/4</td>
<td>28</td>
<td>53</td>
<td>7318793810908</td>
<td>52 009-328</td>
</tr>
<tr>
<td>32</td>
<td>G1 1/2</td>
<td>35</td>
<td>59</td>
<td>7318793811004</td>
<td>52 009-335</td>
</tr>
</tbody>
</table>

### Compression connection

Support bushes shall be used, for more information see catalogue leaflet FPL.

Should not be used with PEX-pipes.

**Chrome plated**

<table>
<thead>
<tr>
<th>Valve DN</th>
<th>D</th>
<th>Pipe Ø</th>
<th>L**</th>
<th>EAN</th>
<th>Article No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>G3/4</td>
<td>15</td>
<td>27</td>
<td>7318793705006</td>
<td>53 319-615</td>
</tr>
<tr>
<td>15</td>
<td>G3/4</td>
<td>18</td>
<td>27</td>
<td>7318793705105</td>
<td>53 319-618</td>
</tr>
<tr>
<td>15</td>
<td>G3/4</td>
<td>22</td>
<td>27</td>
<td>7318793705204</td>
<td>53 319-622</td>
</tr>
<tr>
<td>20</td>
<td>G1</td>
<td>28</td>
<td>29</td>
<td>7318793705402</td>
<td>53 319-928</td>
</tr>
</tbody>
</table>

*) Fitting length (from the gasket surface to the end of the connection).

**) Over all length L refers to unassembled coupling.

## Accessories

### Protection cap

For TA-COMPACT-P/-DP, TA-Modulator (DN 15-20), TBV-C/-CM/-CMP, KTCM 512.

<table>
<thead>
<tr>
<th>For valve</th>
<th>EAN</th>
<th>Article No</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN 15-20</td>
<td>Red 7318793961105</td>
<td>52 143-100</td>
</tr>
</tbody>
</table>