Harmony
Installation, Operation and Maintenance

Engineering
GREAT *Solutions*

Harmony

Technical Description

Application:
HVAC, Chilled and Hot Water Hydronic Systems

Functions:
Control, Balancing, Pre-Setting, Differential Pressure
Control, Measuring, Shut-off and Maintenance

Sizes:
1/2", 3/4" 1", 1-1/4"

Pressure class:
400 psig

Differential pressure (ΔpV):
2-80 psi

Flow range:
1/2"   Min 0.2 / Max 2.0 gpm
3/4"   Min 0.5 / Max 5.0 gpm
1"   Min 0.2 / Max 11 gpm
1-1/4"   Min 4.0 / Max 20 gpm

Temperature:
Max. working temperature: 250˚ F
Min. working temperature: -20˚ F

Stroke:
1/2"   4 mm
3/4"   6 mm
1"   9 mm
1-1/4" 10 mm

Media:
Water with HVAC additives

Leakage rate:
<0.01% of Maximum Cv

Material:
Valve body: DZR Brass
Valve plug: Brass, EPDM Presetting parts
PPS composite
Spindle: Stainless Steel
Spindle seat: EPDM
Δp insert: Brass for containing pressure, PPS composite
internals
Membrane: EPDM
Springs: Stainless Steel
O-rings: EPDM

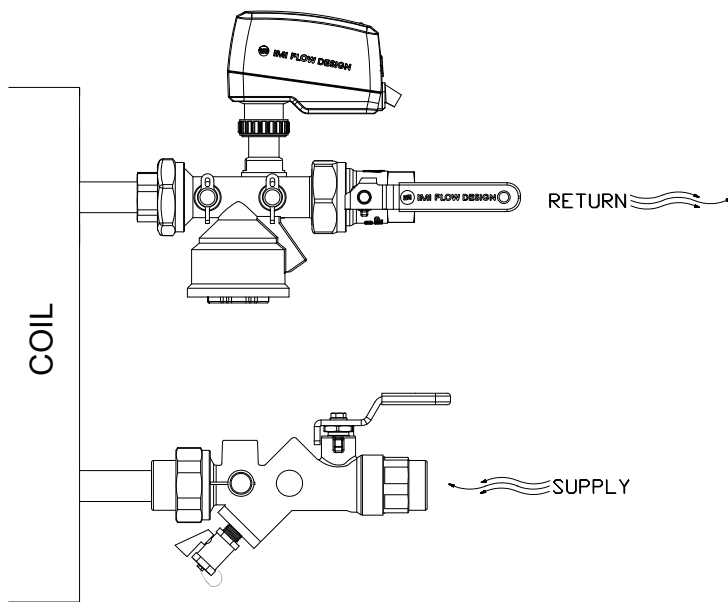**Marking:**
400 wwp, flow direction arrow, size

End Connections:
Inlet - SWT, FPT, MPT
Outlet - SWT, FPT

Connection to actuator:
M30 X 1.5 Thread

Installation

Location
Harmony is designed to be installed on the return side of the terminal.This will place the isolation valve on the "system side". If there is a great desire to install Harmony on the supply side of the terminal instead, please consult factory.

Straight Run Requirements
Harmony requires no straight run upstream nor downstream of the valve.

Orientation
These valves can be installed and will work properly in any orientation provided that the pipe is full of water. An arrow on the body indicates the regulated flow direction: water flowing in the opposite direction will not be regulated. With actuators other than IMI, the actuator might have to be above the main body of the valve.

Operation

Flushing

If the system needs to be flushed, it may be useful to stop the regulating function on the Harmony valve. For this purpose, a screw is provided to stop pressure from being communicated to the low-pressure side of the regulator, thereby locking it temporarily in place.

When flushing system, stop flow to the terminal and then tighten the screw shown in the illustration below using either a 2 mm or 5/64 allen wrench. This will disable regulating function, allowing higher flow through the valve. Now reopen the isolation valve.

After flushing the system, be sure to loosen the screw on every Harmony valve in order to re-enable regulation. There is no need to stop flow while re-opening the screw. The screw should be stopped when it reaches an internal safety clip, but if not do not unscrew beyond the surface of the body.
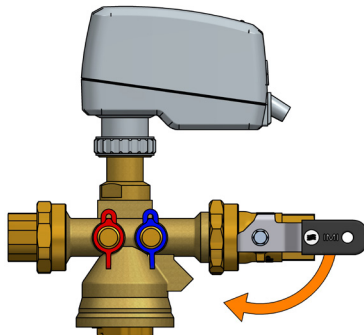

To Close

Regulation Shut-Off Screw
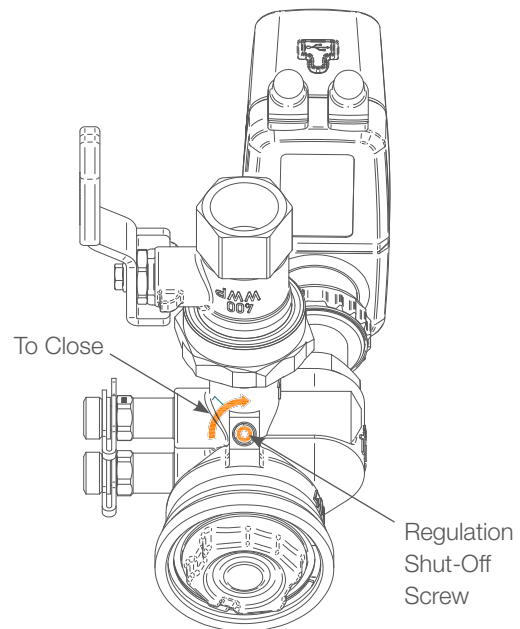
Setting
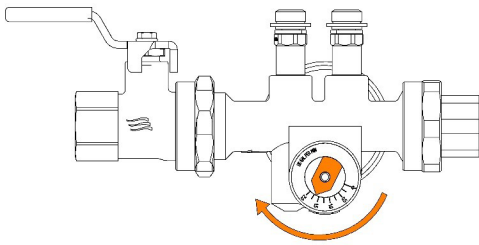
1. Remove actuator by rotating coupling ring counter-clockwise.
2. Turn pointer to the desired flow (label is in US GPM)
    a. If there is no pressure in the system, the pointer can be turned by hand.
    b. If there is pressure, awrench might be needed.

Re-Install actuator

Isolation

Close the attached Ball Valve

Model Order Designation

Coding:
HM{xxx} - {e1} - {e2}

HM: Harmony Pressure Independent Control Valve

[xxx]: Size (050 for 1/2", 075 for 3/4")

[e1]: Runout end type (S - Sweat, F - Female NPT))

[e2]: Terminal end type (S, F, M, RS, RF, RM where R indicates reduced)

Example:
HM075 - F - F

Harmony Valve, 3/4" Female NPT runout, 3/4" Female NPT on terminal end.

Harmony 160 Actuator

Technical Description

Functions:
Proportional control
Manual override
Self-stroking
Mode, status and position indication
Stroke limitation setting
Valve blockage protection
Valve clogging detection
Error safe position
Diagnostic/Logging

Supply Voltage:
24 VAC/VDC ±15%
Frequency 50/60 Hz ±3 Hz.

Power Consumption:
Operation: < 1 VA (VAC); < 0.6 W (VDC)   Standby: < 0.5 VA (VAC); < 0.25 W (VDC)

Input Signal:
0(2)-10 VDC, Ri 47 kΩ.
Adjustable sensitivity 0.1-0.5 VDC.
0.33 Hz low pass filter.
Proportional:
0-10, 10-0, 2-10, 10-2 VDC
Proportional split-range:
0-5, 5-0, 5-10, 10-5 VDC
0-4.5, 4.5-0, 5.5-10, 10-5.5 VDC
2-6, 6-2, 6-10, 10-6 VDC

Output Signal:
Ranges: See "Input signal".

Characteristics:
Linear, EQM 0.25 and inverted EQM 0.25

Control Speed:
254 s/in

Adjusting Force:
36 lbf. Self-adjusting for IMI Hydronic
Engineering valves.

Temperature:
Operating environment: 32°F – +122°F
(5-95%RH, non-condensing)
Storage environment: -4°F – +158°F
(5-95%RH, non-condensing)

Ingress Protection:
IP54
(all directions)
(according to EN 60529)

Protection Class:
(according to EN 61140)
Harmony160 (SELV)

Cable:
3.28 ft, 6.56 ft or 16.4 ft. With wire end sleeves.
Harmony160 : type LiYY, 3x30 AWG (3x0.25 mm2).

Stroke:
0.25 in. Automatic detection of the valve lift (self-stroking).

Noise Level:
Max. 30 dBA

Weight:
0.44 lb

Connection to Valve:
Retainer nut M30x1.5.

Material:
Cover: PC/ABS GF8
Housing: PA GF40.

Function

Setting
The actuator can be set by the HyTune app (iOS version 8 or later on iPhone 4S or later, Android version 4.3 or later) + the Dongle device, with or without the actuator power supplied.
The setting configuration can be stored in the Dongle for setting of one or several actuators. Press the configuration button on the Dongle, after connecting to the actuator.
HyTune can be downloaded from the Apple App Store or Google Play.
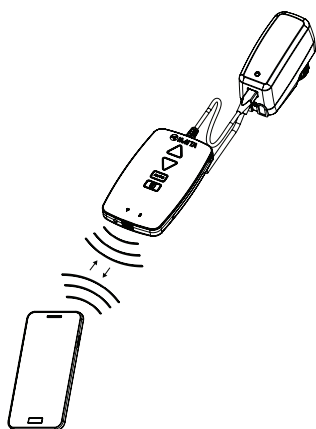
Manual Override
By using the Dongle device. No power supply needed.

LED indication

Status	Red (heating) Blue (cooling	
Fully retracted (actuator stem)	Long pulse Short pulse	(—· —· —·)
Fully retracted (actuator stem)	Short pulse Long pulse	(·— ·— ·—)
Intermediate position	Long pulse	(— — —)
Moving	Short pulse	(· · ·)
Calibrating	2 Short pulse	(·· ·· ··)
Manual mode or no power supply	Off	

Error code	Violet	
Power supply too low	1 pulse	(· · ·)
Line broken (2-10 V or 4-20 mA)	2 pulse	(·· ·· ··)
Valve clogging or foreign object	3 pulse	(··· ··· ···)
Stroke detection failure	4 pulse	(···· ···· ····)

If an error is detected, violet pulses are displayed as the red or blue status lights flash alternately.
More detailed information, please see the HyTune app + Dongle.

Calibration/self-stroking
According to selected settings in the table.

Type of calibration	At power on	After manual override
Both end positions (full)	√*	√
Fully extended position (fast)	√	√*
None	√	

*) Default

Note: A calibration refresh can be automatically repeated monthly or weekly.
Default setting: Off.

Self-adjusting force
Automatic valve type detection, the force is set to 36 lbf or 45 lbf for IMI Flow Design valves.
Default setting: On.

Stroke limitation setting
The stroke can be set to a percentage (20-100%) of detected valve lift.
For some IMI Flow Design valves it can also be set to a Cv_{max}/q_{max}.
Default setting: No stroke limitation (100%).

Valve blockage protection
If no actuation is performed for one week or one month, the actuator will perform one full stroke cycle.
Default setting: Off.

Valve clogging detection
If actuation stops before the desired value is reached, the actuator moves back ready to make a new attempt. The actuator will move to the configured error safe position after three attempts.
Default setting: On.

Error safe position
Fully extended or retracted position when following errors occur; low power, line break, valve clogging or stroke detection failure.
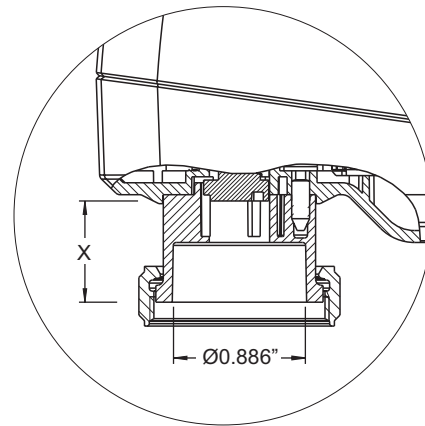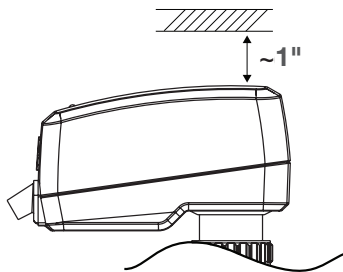Default setting: Fully retracted position.

Diagnostics/logging
The last 10 errors (low power, line break, valve clogging, stroke detection failure) with time-stamps are readable by the HyTune app + Dongle device. Time-stamps of past errors will be cleared if the power is disconnected.
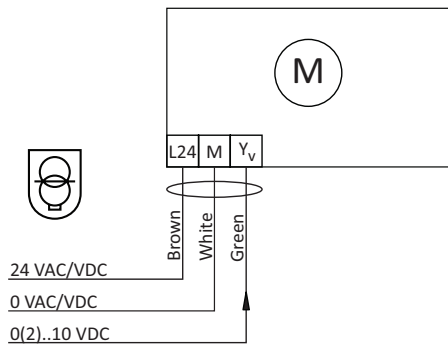
Installation

IP54

Note:

~1"

X

Ø0.886"
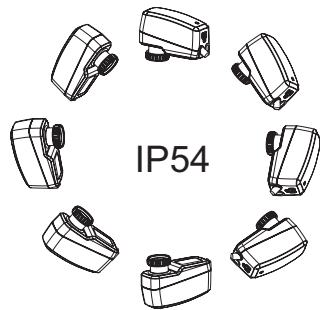
X = 0.394" - 0.665"

Connection Diagram

Harmony Actuator 160

M

L24 M Y$_v$

Brown White Green

24 VAC/VDC
0 VAC/VDC
0(2)..10 VDC

Terminal	Wire Color	Description
L24	Brown	Power supply 24 VAC/VDC
M	White	Neutral for power supply 24 VAC/VDC and signals
Yv	Green	Input signal for proportional control 0(2)-10 VDC, 47 kΩ

24 VAC/DC operating only with safety transformer according EN 61558-2-6

IMI
Hydronic Engineering