IMI FLOW DESIGN

Harmony

Pressure Independent
Balancing and Control Valve

Engineering
GREAT Solutions

IMI Hydronic Engineering

HARMONY

The Harmony delivers a complete hydronic balancing and control solution that optimizes the performance of cooling and heating systems. Engineered to provide more precise control at minimal energy consumption, Harmony advances PICV technology with first-in-the-industry innovations for enhanced measuring and diagnostics, easier system maintenance and faster commissioning.

Key Features

> **More Precise Control**
No lift limitations with the full stroke of the valve while maintaining the ability to set maximum flow rates prevents overflow at all terminal units.

> **Minimal Energy Consumption**
Harmony's startup pressure at 2 psi is the lowest in the industry.

> **Trouble-Free Set Up in the Field**
Easy-to-use dial lets users set the exact GPM, without time-consuming calibrations.

> **Built-in Feature**
The first-of-its kind feature in the HVAC industry, Harmony's integral bypass valve allows for flushing after installation.

> **True Isolation and Increased Serviceability**
Harmony's unique breakaway isolation valve saves time and money installing one separately in the field.

> **Easy Installation**
One of the smallest and lightest PICVs in the industry, Harmony can be installed in any orientation.

> **High Reliability**
DZR brass and stainless steel guarantees high corrosion resistance and reduces the risk of leakage.

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"

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

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

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

Media:
Water with HVAC additives

Leakage rate:
<0.01% of Maximum Cv

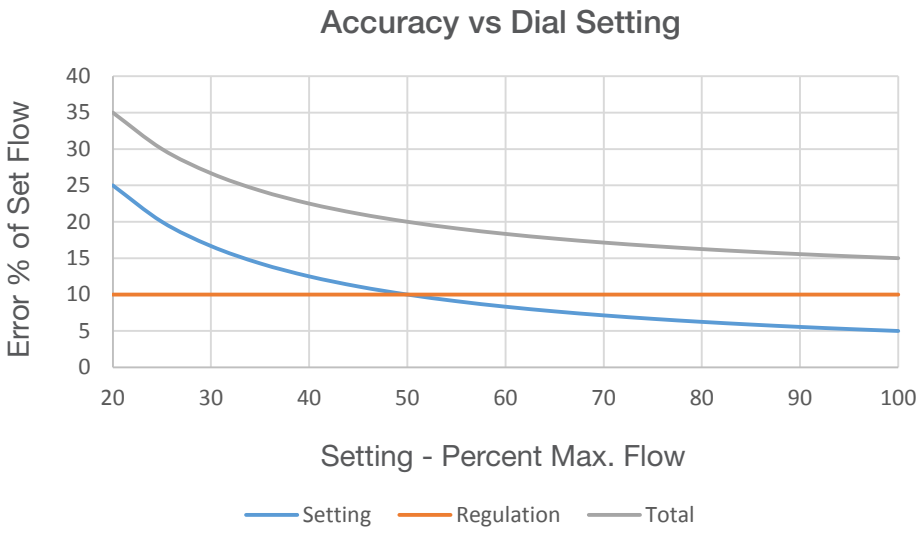
Material:
Valve body: DZR Brass
Valve plug: Brass, EPDM Presetting parts PPS composite
Spindle: Stainless Steel
Spindle seat: EPDM
Δp insert: Brass for containing pressure, PPS composite internals
Membrane: EPDM
Springs: Stainless Steel
O-rings: EPDM

Marking:
400 wwp, flow direction arrow, size

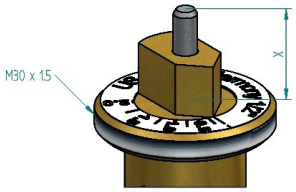
End Connections:
Inlet - SWT, FPT, MPT
Outlet - SWT, FPT

Measuring Accuracy

Maximum flow deviation at different settings



Actuator Connection



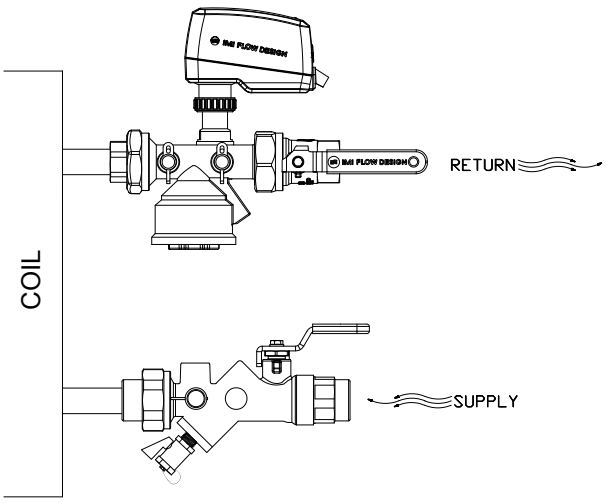
Valve Size	X-Closed, min
1/2"	0.41" (10.5 mm)
3/4"	0.40" (10.1 mm)

Starting Pressure

Model	Flow					
	0.5	1	2	3	4	5
HM050	2.0 psi	2.0 psi	2.2 psi	-	-	-
HM075	2.0 psi	2.0 psi	2.0 psi	2.0 psi	2.2 psi	2.5 psi

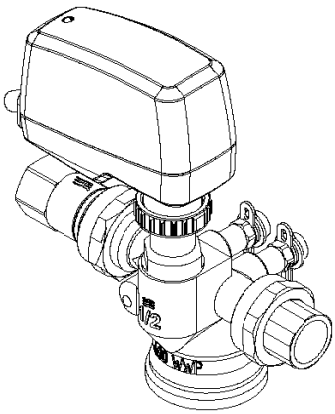
Installation

Application Example



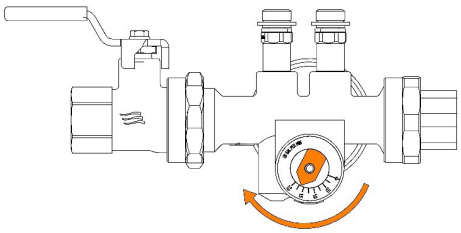
Installation of Actuator

Approx. 1" in of free space is required above the actuator. Place the actuator onto the valve and tighten the threaded nut.



Operation

Setting

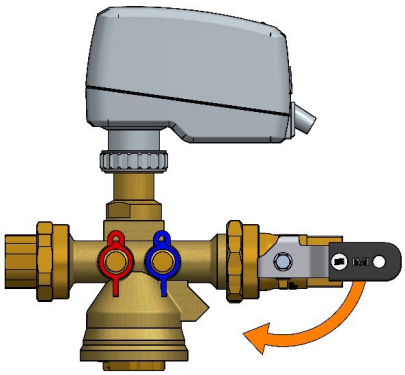


1. Remove actuator by rotating coupling ring counter-clockwise.

2. Turn pointer to the desired flow (label is in GPM)
   a. If there is no pressure in the system, the pointer can be turned by hand.
   b. If there is pressure, a wrench might be needed.

3. Re-Install actuator.

Shut-Off



Close the attached Ball Valve.

Operating Instructions

Measuring ΔH

The two P/T ports allow measurement of the total pressure drop across the valve. If it is more than the required minimum pressure at the desired flow, then the pump head in the system could be reduced by the difference without affecting the terminal where the measured unit is attached. Find the terminal with the least excess pressure, and reduce the pump pressure by the difference at that terminal.

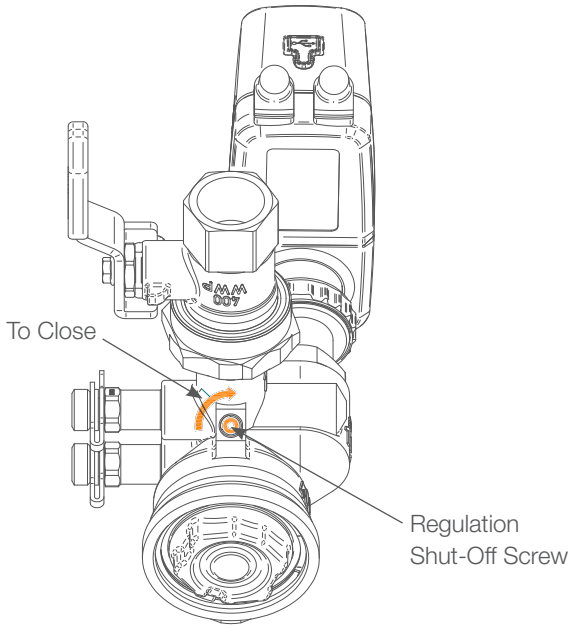
Flushing System

When flushing system:

Step 1: 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.

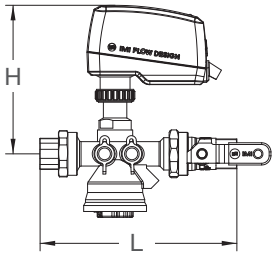
Step 2: This will disable regulating function, allowing higher flow through the valve.

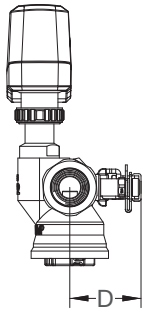
Step 3: Reopen the isolation valve.



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 stop when it reaches an internal safety clip, but if not do not unscrew beyond the surface of the body.

Installation





Nominal Dimensions & Weights / Cv Rates

Size	L [in]	H [in]	D [in]	Cvs	Weight w/Actuator lb	Weight w/o Actuator lb
1/2"	6.6	5.0	2.0	1.4	3.1	2.6
3/4"	7.2	5.0	2.2	3.5	4.4	3.8

Connections

S = sweat F = female NPT M = male NPT

Model	Size in./mm		Outlet Connection in./mm			Inlet Connection in./mm		
HMY050	1/2"	(15)	1/2"	(15)	F, S	1/2"	(15)	F, M, S
			3/4"	(20)	F, S	3/4"	(20)	F, M, S
HMY075	3/4"	(20)	3/4"	(20)	F, S	1/2"	(15)	F, M, S
						3/4"	(20)	F, M, S
						1"	(25)	M, S

Model Order Designation

Model Size
1/2" Harmony

Inlet Connection
See specifications for available connections.

HMY075F - 050F - MI

Outlet Connection
Ball valve end first. See specifications for available connections.

Options
Use for options that have specific locations. Metal I.D. Tag Shown

S = female sweat **F** = female NPT **M** = male NPT

Options Available

DX Ext. P/T Ports

EH Extended Handle

MI Metal ID Tag

Harmony 160 Actuator

The Harmony 160 Actuator requires the lowest power consumption and the least programming time in the industry. Fully programmable without power, the Harmony's wide range of set-up options and adjustable maximum stroke of the valve bring unprecedented opportunities for advanced hydronic balancing and control of your HVAC systems.

Key Features

> **Convenient, Reliable Set-up**
Fully customizable by smart phone via Bluetooth, app, and Dongle, users can program multiple Harmony actuators with just a few clicks.

> **Time-Saving Copy of Settings**
Identical settings can be copied from Dongle to multiple Harmony actuators, for 50% faster commissioning than conventional actuators.

> **Extensive Setup Flexibility**
More than 200 setup options allow for the configuration of input and output signals, binary input, relay, characteristics and many other on-site parameters.

> **Easy Diagnostic**
The only actuator range with memory of the previous 10 errors allows users to find possible system faults quickly.

> **Digital Setup Comfort**
Unique digital configuration provides on-site adaptability to real system conditions, even in buildings without BUS communication.

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:
Media temperature: 32°F – +248°F
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.
Swivelling nut: Nickel-plated brass.

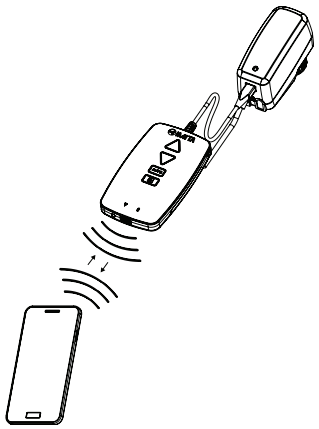
Marking:
Label: IMI Flow Design, CE, product name, article No. and technical specification.

Certification:
LV-D. 2014/35/EU: EN 60730-1, -2-14.

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 Cvmax/qmax.
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.

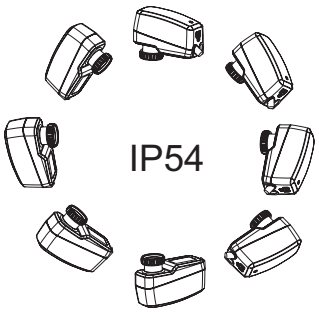
Error safe position

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

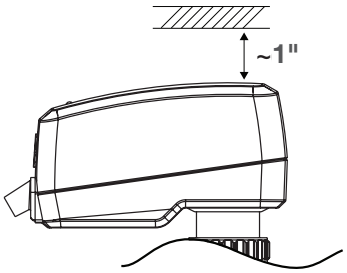
Diagnostics/logging

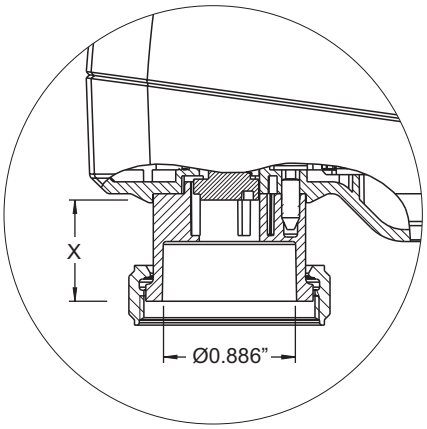
The last 10 errors (low power, line break, valve clogging, stroke detection failure) with time-stamps are readable by the HyTune app + Dongle device. Time-stamps of past errors will be cleared if the power is disconnected.

Installation



Note:

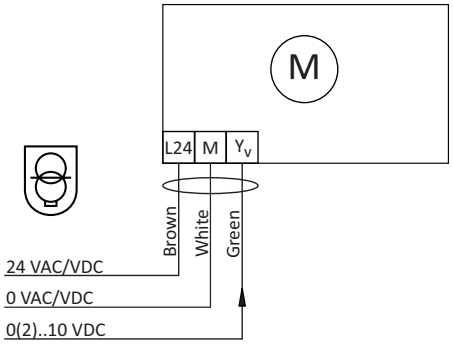




X = 0.394" - 0.665"

Connection Diagram

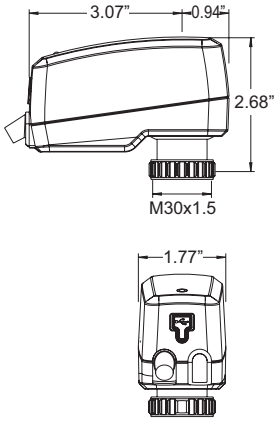
Harmony Actuator 160



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

Articles

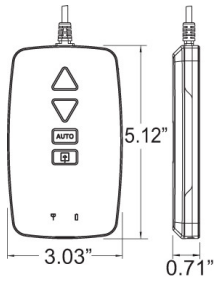


Harmony 160 Actuator

Input signal: 0(2)-10 VDC

Cable length	Supply voltage
3.28 ft.	24 VAC/VDC
6.56 ft.	24 VAC/VDC
16.4 ft.	24 VAC/VDC
With halogen free cable	
3.28 ft.	24 VAC/VDC
6.56 ft.	24 VAC/VDC
16.4 ft.	24 VAC/VDC

Additional Equipment



Dongle

For Bluetooth communication with the app HyTune, transfer configuration settings and manual override

US F376.0 Harmony 12.2016