

PEM L 101

POND WATER LEVEL CONTROLS

**CONTROL PANELS, LEVEL SENSORS,
SOLENOID VALVES, FILL SPOUTS & PARTS**

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PEM L101 WATERLEVEL CONTROL PANELS

PEM L101-51 SINGLE LEVEL CONTROL PANEL

#441-1100 (120V - 60 C.)
#441-1200 (240V - 50 Hz.)



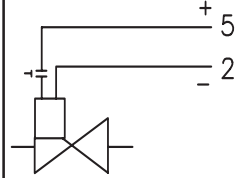
WATER MAKE UP AND/OR LOW LEVEL SAFETY SHUT OFF CONTROLS FOR FOUNTAIN PONDS

PEM L 101 - 51 CONTROL PANEL , when connected to a suitable PEM L 101 Series Single Sensor will provide a single stage waterlevel control system. This control panel will operate an automatic water make up solenoid fill valve to maintain a constant operational waterlevel within a 6.35mm - 0.250" differential in a fountain pond or could be used as a low level safety shut off switch for the electrical equipment in a fountain pond, should the waterlevel drop below safe operating level. Sensor float switch operates with 12 VAC. A 24 VAC - 50 VA safety power supply is included for the direct operation of a 24 V solenoid fill valve in the water make up circuit. The wall mounted control panel is within a NEMA Type 4 Corrosion resistant polycarbonate enclosure. Wiring to sensor requires 2 unshielded conductors.

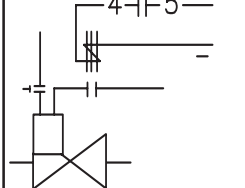
TERMINALS & FUNCTIONS

- | | | | |
|-----|--|-----|----|
| 1 | Sensor IN , 12 VAC | —○— | 1 |
| 2 | Sensor , OUT , 12 VAC
(Also common for 24VAC Valve circuit) | —○— | 2 |
| 4 | Common for controlled circuit.
Switch Rating :
Max.240 V. - 3 A. non inductive
(For 24 V,40VA Valve circuit -
connect conductor 4A to Terminal 4). | —○— | 4A |
| 5 | N.O. controlled circuit OUT | —○— | 5 |
| 6 | N.C. controlled circuit OUT | —○— | 6 |
| 7,8 | Power Supply | —○— | 7 |
| | PEM # 441-1100 = 120V.,60Hz,3A. | —○— | 8 |
| | PEM # 441-1200 = 240V.,50Hz,2A. | —○— | |

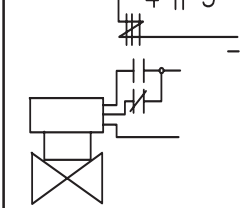
L 101 - 51 & 71,
Direct connection for 24 V Solenoid Fill Valve, jumping 4A to 4 (24 Vac - 40VA.)



L 101 - 51 & 71, Indirect Solenoid Valve Connection for Water Make Up



L 101 -51 & 71, Indirect Motorized Valve Connection for Water Make Up



PEM L101-71 DUAL LEVEL CONTROL PANEL

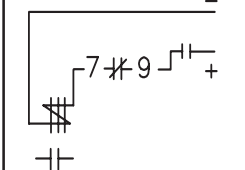
#443-3100 (120V - 60 C.)
#443-3200 (240V - 50Hz.)



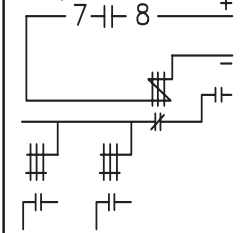
PEM L 101 - 71 CONTROL PANEL , when connected to a suitable PEM L 101 Series Dual Sensor will provide a dual stage waterlevel control system. This control panel will operate an automatic water make up solenoid fill valve to maintain a constant operational waterlevel within a 6mm - 0.250" differential in a fountain pond and in addition it has a low level safety shut off switch for the electrical equipment in a fountain pond, should the waterlevel drop below safe operating level. Sensor float switches (2) operate with 12 VAC. A 24V-50VA safety power supply is included for the direct operation of a 24 V solenoid fill valve in the water make up circuit. The wall mounted control panel is within a NEMA Type 4 Corrosion resistant polycarbonate enclosure. Wiring to sensor requires 3 unshielded conductors.

- | | | | |
|---------|---|-----|----|
| 1 | Lower Sensor IN, 12 VAC
(Low Level Safety Shut Off Sensor) | —○— | 1 |
| 2 | Sensors Common, 12 VAC
(Also common for 24 VAC Valve circuit) | —○— | 2 |
| 3 | Upper Sensor IN, 12 VAC
(Water Make up Sensor) | —○— | 3 |
| 4 | Common for Water Make Up circuit, IN
Switch Rating: (Dry switch)
Max.240 V - 3 A. , non inductive
(For 24 V, 40VA Valve circuit -
connect conductor 4A to Terminal 4) | —○— | 4A |
| 5 | N.O. Water Make Up Circuit OUT
Connect 24 VAC fill valve to terminals 2 & 5 | —○— | 5 |
| 6 | N.C. Water Make Up Circuit OUT | —○— | 6 |
| 7 | IN, Common for Low Level Safety Shut Off
Switch Rating: (Dry switch)
Max. 240 V - 3 A., non inductive | —○— | 7 |
| 8 | N.O. Safety Shut Off Circuit OUT | —○— | 8 |
| 9 | N.C. Safety Shut Off Circuit OUT | —○— | 9 |
| 10 & 11 | Power Supply | —○— | 10 |
| | PEM # 443-3100 = 120 V, 60 Hz, 3A. | —○— | 11 |
| | PEM # 443-3200 = 240 V, 50 Hz, 2A. | —○— | |

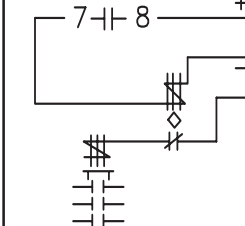
L101 - 71
Low Water Safety Shut Off for Illumination Contactor or Pump Starter



L101 - 71
Low Water Safety Shut Off for Illumination Contactor & small size Pump Motor Starter



L 101 - 71
Low Water Safety Shut Off with Time Delay Relay for larger size Pump Starters



PEM WATER LEVEL SENSORS FOR PEM L101 CONTROLS

CONSTRUCTION:

PEM L 101 - 01 is made of cast bronze, brass and copper and is stainless steel fitted.

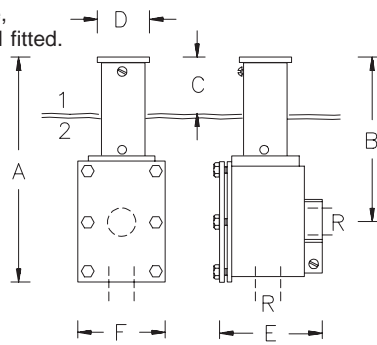
DESCRIPTION: PEM L101 - 01 single float switch sensor operates on a 6mm/0.250" waterlevel differential. This sensor when connected to a PEM L 101 - 51 control panel will operate a solenoid fill-valve for water make up or when installed at a lower level can be used as safety shut off for electrical equipment in a fountain pond.

When two sensors are used, they are connected to a PEM L101-71 Control Panel, allowing for unlimited water make up or water make up and safety shut off.

As the sensor is not height adjustable, great care must be taken to install it to the final waterlevel elevation.

For U.L. listed controls, see PEM L 104.

CONDUIT MOUNTED SINGLE SENSOR



DIMENSIONS :

A	195mm - 7.680"
B	140mm - 5.500"
C	51mm - 2.000"
D	54mm - 2.125"
E	86mm - 3.375"
F	83mm - 3.250"
R	3/4" NPT -BSP

ELECTRICAL RATINGS:

12 Vac., 20 VA Non Inductive
Float switch is either N.C. or N.O. by up-ending its float.

PEM L101 - 01

#444-1010



CONDUIT MOUNT ADJUSTABLE SINGLE SENSOR

PEM L101 - 05

#444-2010

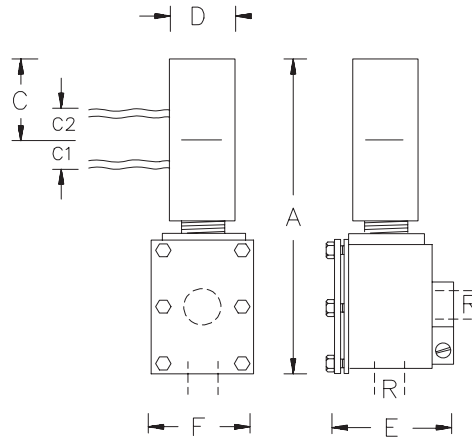
CONSTRUCTION:

PEM L 101 - 05 is made of cast bronze, brass and copper and is stainless steel fitted.

DESCRIPTION: PEM L101 - 05 single float switch sensor operates on a 6.35mm / 0.250" waterlevel differential. This sensor when connected to a PEM L101- 51 control panel will operate a solenoid fill valve for water make up or when installed at a lower level can be used as safety shut off for electrical equipment in a fountain pond.

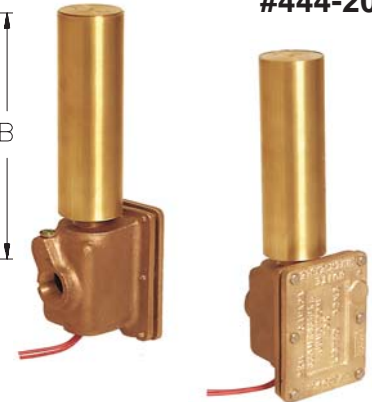
When two sensors are used, they are connected to a PEM L101- 71 Control Panel, allowing for unlimited water make up or adjustable water make up & safety shut-off. The sensor is height adjustable by a total of 51mm - 2.0". Height adjustment, after pool is filled, by removal of sensor cover and sliding float switch mounted on brass stem up or down to suit. A locking collar preserves the adjustment.

For U.L. listed level controls, see PEM L 104



A	270mm - 10.630"
B	214mm - 8.430"
C	70mm - 2.750"
C1 *	25mm - 1.000"
C2 *	25mm - 1.000"

D	51mm - 2.000"
E	86mm - 3.375"
F	83mm - 3.250"
R	3/4" NPT -BSP
*	= Adjustment Range



ELECTRICAL RATINGS :

12 Vac., 20 VA Non Inductive
Float switch is either N.C. or N.O. by up-ending its float.

WALL MOUNTED SINGLE SENSOR, TOP ACCESS

PEM L101 - 12

#444-3010

PEM L101-12 single float switch sensor (used by itself), operates on a 6mm/0.25" waterlevel differential. This sensor when connected to a PEM L101 - 51 control panel will operate a solenoid fill valve for water make up or when installed at a lower level can be used as safety shut off for electrical equipment in a fountain pond. When two sensors are used, they are connected to a PEM L101-71 Control Panel, allowing for unlimited water make up or water make up & safety shut off.

The sensor assembly is cast into a concrete wall or placed anywhere near the pool at the proper elevation (into a flowerbed), connected to the pool by a fill tube. Incorporated into the assembly housing is a vent to prevent air lock. The sensor float switch is suspended by a brass tube, allowing an adjustment of appr. 38mm - 1.5", however the brass tube can be shortened or replaced by a longer one to achieve the desired waterlevel elevation. PEM L101-12 is made of cast bronze, brass and copper, stainless steel fitted. PEM L101-12 Sensor assembly is extremely vandal resistant. For waterproofing the fill tube use **PEM 6390** surface flange or membrane clamp.

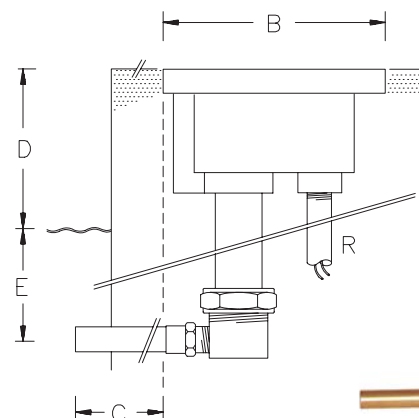
FOR INSTALLATION, THE VENT HOLES IN COVER MUST BE TAPED OVER!

This sensor can also be supplied at no additional costs with a vent tube into freeboard of pool to same length as 'C'. Specify : ..WITH VENT TUBE.

ELECTRICAL RATINGS: 12 Vac., 20 VA, Non Inductive

Float switch is either N.C. or N.O. by up-ending its float.

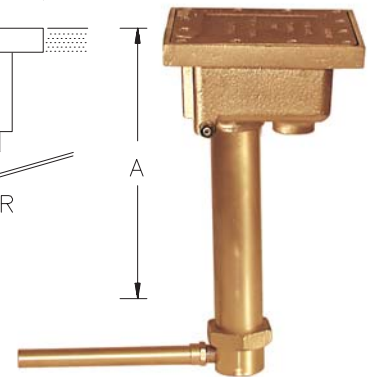
* Can be customized at extra costs to given dimension specifications.



DIMENSIONS :

A	Standard *	305mm /12.000"
	Minimum	150mm / 6.000"
	Maximum	None
B	Square Top	156mm / 6.125"
C	Standard *	150mm / 6.000"

D	Standard *	230mm / 9.000"
	Minimum	140mm / 5.500"
	No Maximum,	to fit into 'D' + 'E'
E	Minimum	76mm / 3.000"
R		1/2" NPT / BSP



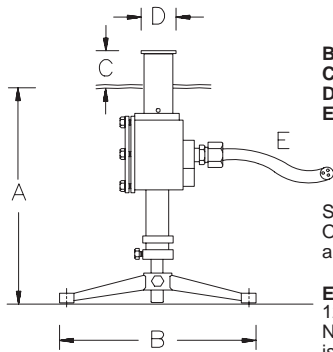
For U.L. listed level controls, see PEM L 104 Series.

PEM WATER LEVEL SENSORS FOR PEM L101 CONTROLS

PEM L101-16

FREE STANDING SINGLE SENSOR

#444-4010



- DIMENSIONS :**
A 305/406mm-12"/16"
 Height Adjustable Stand
B 250mm - 10.000"
C 51mm - 2.000"
D 45mm - 1.750"
E Electrical Cable
 16/3 STW or SOW

Standard Length: 2.7m/9ft.
 Other lengths optional and extra

ELECTRICAL RATINGS:
 12 Vac., 20 VA,
 Non Inductive Float switch is either N.C. or N.O. by up-ending its Switch floats.

PEM L101-16 is made of cast bronze, brass and copper and is stainless steel fitted. PEM L101 - 16 single float switch sensor (when used by itself), operates on a 6.35mm/ 0.250" waterlevel differential. This sensor, when connected to a PEM L101 - 51 control panel, will operate a solenoid fill valve for water make up or when installed at a lower level can be used as safety shut off for electrical equipment in a fountain pond. When two sensors are used, they are connected to a PEM L101-71 Control Panel, allowing for unlimited water make up or water make up & safety shut-off. Final waterlevel adjustment in a pool can be achieved when pool is filled by extending or contracting the sensor stand. In North America, the sensor must be fed through a separate conduit. Elsewhere, depending on codes, the sensor can be attached to a junction box, feeding underwater lights, or be supplied with long cable for outside of pool connection.

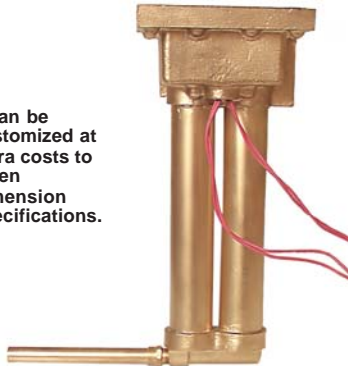
For U.L. listed water level controls, see PEM L104 Series.
 For greater depths the sensor: PEM L101-17 (#444- 4110) is custom made to given specifications. This sensor has a heavy duty, 300mm/ 12.0" tripod stand.

PEM L101-29

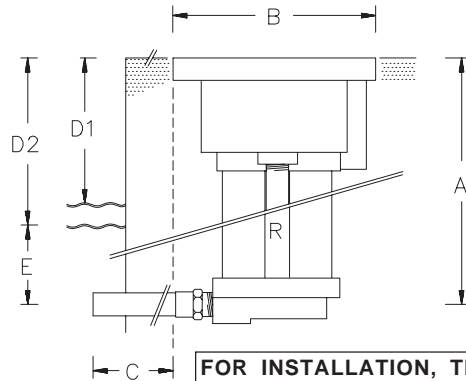
TOP ACCESS WALL MOUNTED DUAL SENSOR

#444-5020

* Can be customized at extra costs to given dimension specifications.



ELECTRICAL RATINGS :
 12 Vac., 20 VA, Non Inductive Float switches are either N.C. or N.O. by up-ending the switch floats.



FOR INSTALLATION, THE VENT HOLES IN COVER MUST BE TAPED OVER!
 This sensor can also be supplied at no additional costs with a vent tube into the free board of pool to same length as 'C'. Specify: ..WITH VENT TUBE.

PEM L101-29 is made of cast bronze, brass and copper and is stainless steel fitted. PEM L101- 29 dual float switch sensor operates on a 6.35mm/0.250" waterlevel differential for water make up and on a 38mm / 1.500" differential (or as adjusted) for the low level safety shut off. This sensor when connected to a PEM L101 - 71 control panel will operate a solenoid fill valve for water make up and as safety shut off for electrical equipment in a fountain pond. The safety shut off circuit can also be used for pump up / pump down control or for a greater than 6mm / 0.250" level differential. The sensor assembly is cast into concrete or placed anywhere near the pool (into a flowerbed) with proper elevation, connected to the pool by a fill tube. Incorporated into the assembly housing is a vent to prevent air lock in the sensor housings. The sensor float switches are suspended by brass tubes, allowing sensor adjustments of appr. 38mm - 1.5", however the brass tubes can be shortened or replaced by longer ones to achieve the desired waterlevel adjustment. PEM L101 - 29 Sensor assembly is extremely vandal resistant. For fill tube waterproofing use PEM 6390 flange or membrane clamp. For U.L. listed level controls, see PEM L104 Series.

DIMENSIONS :

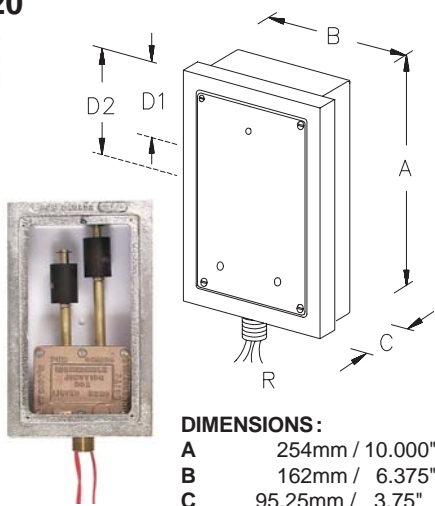
- A** Standard * 343mm/13.5"
 Minimum 150mm/6.0"
 Maximum None
B Square Top 156mm/6.125"
C Standard * 150mm/6.0"
D1 Water Make Up
 Level Differential 6.35mm/0.250"
 Standard * 230mm/9.0"
 Minimum 140mm/5.5"
 No Maximum, specify

- D2 Safety Shut Off**
 Level Differential = 'D1'
 Standard * 264mm/10.5"
 Minimum 178mm/7.0"
 No Maximum , specify
E Minimum 77mm/3.0"
R 1/2" NPT / BSP

PEM L101-32

FRONT ACCESS WALL MOUNTED DUAL SENSOR

#444-6020



ELECTRICAL RATINGS :
 12 Vac., 20 VA, Non Inductive Float switches are either N.C. or N.O. by up-ending the .35.35 Switch Floats.
 For U.L. listed level controls see: PEM L104 Series.

- D1 Water Make Up**
 6.35mm/0.250" Differential
 Appr.(40-50mm/1.5"/2.0"
 Adjustment Range after installation)
D2 Safety Shut Off
 Differential to D1
 Appr.(50-76mm/2.0"-3.0"
 Adjustment Range after installation)
R 1" NPS / BSP

DIMENSIONS :

- A** 254mm / 10.000"
B 162mm / 6.375"
C 95.25mm / 3.75"

PEM L101 - 32 is made of cast bronze, brass and copper, stainless steel fitted with a Kydex or ABS forming niche. PEM L101-32 dual float switch sensor operates on a 6mm / 0.250" waterlevel differential for water make up and on a 38mm/1.500" differential (or as adjusted) for the low level safety shut off. This sensor when connected to a PEM L101 - 71 Control Panel will operate a solenoid fill valve for water make up and as safety shut off for electrical equipment in a fountain pond. The safety shut-off circuit can also be used for pump up / pump down control or for a greater than 6.35mm / 0.250" level differential. The sensor assembly is cast into the face of concrete walls, showing only the face of the bronze frame and the stainless steel cover plate. The sensor float switches are mounted upon brass tubes, allowing sensor adjustments of approx. 254mm - 1.000" after pool is filled. This sensor assembly is also available with a single float switch as PEM L101 - 31 (# 444-6010)

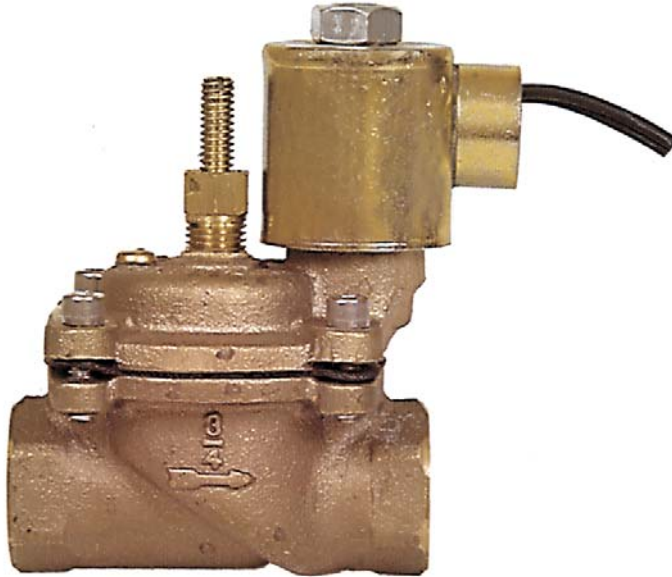
OPTIONAL & EXTRA : Tilemask Add /-58
WATERPROOFING OPTIONS
 Surface Puddle Flange Add /-60
 Surface Waterproofing Membrane Clamp Add /-62

24 VAC SOLENOID FILL VALVES FOR PEM L101 CONTROLS

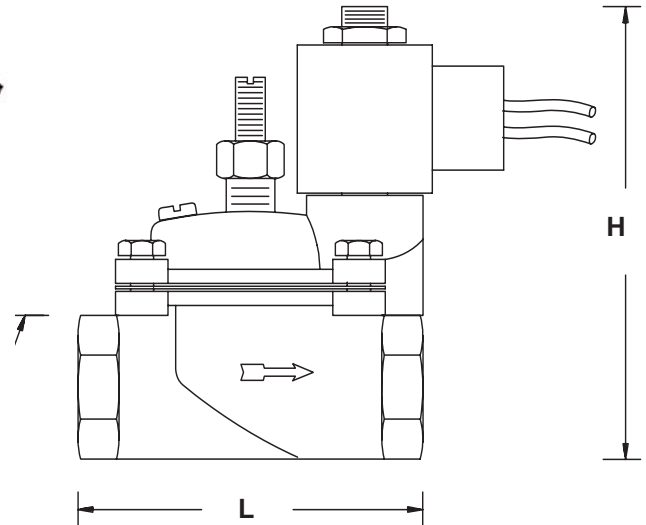
PEM EV-100 SELECT BRONZE SOLENOID FILL VALVES

#462-0100

PEM Select EV100 - Bronze Solenoid Valves are suggested for use with PEM L101 and L104 Waterlevel Control Systems to serve as fill valves. PEM Select EV100 - Bronze Solenoid



EV-102



Valves are designed for use with clean water. Operating voltage is 24VAC 50/60Hz, 12W. Valves are diaphragm type with solenoid operated pilot valve, stainless steel fitted. Solenoid coil is epoxy encapsulated. Valves are equipped with slow closing orifice, manual by pass opening (with screw driver), adjustable micrometric flow control to regulate flow through valve and threaded 1/2" NPS/BSP electrical conduit connection. Pipe thread connections are either NPT or BSP as specified. Maximum pressure rating of valves: 75 PSI - 55 bar. The suggested flow rate for these valves is between the pressure loss of approximately (A) 2 PSI-0.15 bar and the suggested maximum pressure loss of (B) 10 PSI - 0.7 bar. For best performances select valve for flow rate from values given below. For fountains, the pool overflow shall always match in absorption rate the inflow rate of the water supply.

#	PEM select	PIPE size	Flow Range		L m m	L inch.	H m m	H inch.	W m m	W inch.
			(A) L/min	(B) GPM						
462-0120	EV102	3/4"	38 / 95	10 / 25	92.0	3.625"	113.6	4.470"	71.5	2.813"
462-0130	EV103	1"	57 / 151	15 / 40	98.4	3.875"	115.1	4.531"	71.5	2.813"
462-0140	EV104	1 1/4"	84 / 265	22 / 70	124.0	4.875"	139.7	5.500"	90.1	3.578"
462-0150	EV105	1 1/2"	151 / 340	40 / 90	124.0	4.875"	143.7	5.656"	90.1	3.578"
462-0160	EV106	2"	246 / 568	65/150	147.7	5.813"	149.2	5.875"	119.1	4.688"

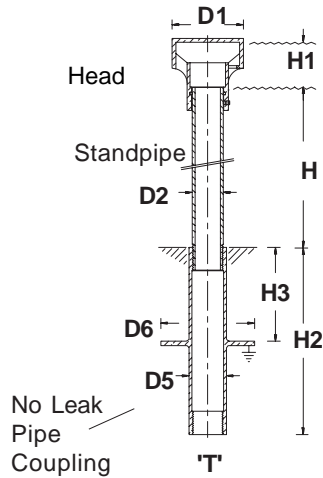
NOTE: These Valves might require suitable Backflow Preventers.

FREE STANDING FILL SPOUTS FOR PEM L101 CONTROLS (FOR IN WALL MOUNTED FILL SPOUTS SEE PEM 6300 FITTINGS)

PEM R1240/60

466-000

Fill Spouts for Concrete Pools



The Fill Spouts are designed to fill pools without undue splashing, noise or disturbance from well above highest possible water level.

The Fill Spouts consist of 3 basic parts:

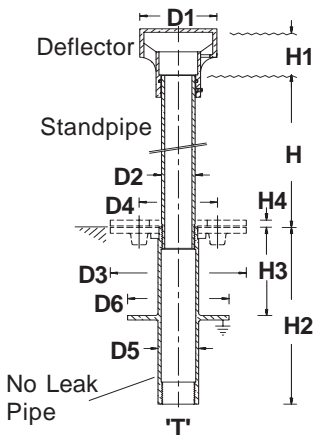
1. Cast bronze **PEM 6374 series No Leak Pipe Coupling** with pipe threads. Flange & Liner Clamp mounted to top of coupling to seal surface pool liner.
2. Brass standpipe with pipe threads.
3. Cast bronze deflector head, with 'O' ring seal and stainless steel lock screw to fasten to stand pipe. Threaded pipe connections must have the threads securely sealed with Teflon Tape or Thread Sealer.

DIMENSIONS:		T	H	H1	H2	H3	D1	D2	D5	D6
#	PEM		mm	mm	mm	mm	mm	mm	mm	mm
466-011	R1241	1"	500	48	200	100	76	33.4	40	100
466-014	R1244	1"	1000	48	200	100	76	33.4	40	100
466-021	R1261	1 1/2"	500	50	200	100	90	49.0	55	100
466-024	R1264	1 1/2"	1000	50	200	100	90	49.0	55	100

PEM R1240/60

466-000

Fill Spouts for Liner Pools



The Fill Spouts are designed to fill pools without undue splashing, noise or disturbance from well above highest possible water level.

The Fill Spouts consist of 3 basic parts:

1. Cast bronze **PEM 6374 series No Leak Pipe Coupling** with pipe threads. Flange & Liner Clamp mounted to top of coupling to seal surface pool liner.
2. Brass standpipe with pipe threads.
3. Cast bronze deflector head, with 'O' ring seal and stainless steel lock screw to fasten to stand pipe. Threaded pipe connections must have the threads securely sealed with Teflon Tape or Thread Sealer.

DIMENSIONS:		T	H	H1	H2	H3	H4	D1	D2	D3	D4	D5	D6
#	PEM		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
466-013	R1243	1"	500	48	200	100	6	76	33.4	134	76	40	100
466-016	R1246	1"	1000	48	200	100	6	76	33.4	134	76	40	100
466-023	R1263	1 1/2"	500	50	200	100	6	90	49.0	152	95	55	100
466-026	R1266	1 1/2"	1000	50	200	100	6	90	49.0	152	95	55	100

PEM R1340

480-7000

Chromed Goose Neck Spouts



#	PEM	NPT/BSP
480-7030	R1343	3/4"
480-7040	R1344	1"
480-7050	R1345	1 1/4"
480-7060	R1346	1 1/2"
480-7070	R1347	2"

Overall height of each goose neck is : 457mm \ 18.00"

PEM R1340

Gooseneck Fill Spouts are designed to comply with plumbing codes, that require the discharge of a water supply into a pool to terminate at a specified distance above the highest possible waterlevel in a pool.

PEM R1340 Fill Spouts are made of copper and are chrome plated.

Where the above plumbing code requirement does not apply, the valve can discharge directly into the pool.

PARTS FOR PEM L 101

CONTROLS, SENSORS, VALVES & FILL SPOUTS

#	PEM	DESCRIPTION
491-0110	L101-51/-05	Transformer,120V
491-0120	L101-51/-06	Transformer,240V
491-0130	L101-51/-08	Green Indicator Lamp,12V
491-0150	L101-51/-09	Relay, 12V
491-0160	L101-51/-10	Circuit Breaker,12V
491-0210	L101-71/-05	Transformer,120V
491-0202	L101-71/-06	Transformer,240V
491-0230-	L101-71/-07	Red Indicator Lamp,12V
491-0240	L101-71/-08	Green Indicator Lamp,12V
491-0250	L101-71/-09	Relay (2) ,12V
401-0260	L101-71/-10	Circuit Breaker,12V
401-0410	L101-20	Float Switch Assembly
401-0510	L101-28/-1	Set of Box Cover bolts, for L101-01,-05,-,16.-31 or -32
401-0520	L101-28/-2	Set of Cover Bolts for L101-12 or -29
401-0530	L101-28/-3	Set of Plate Bolts for L101-31 or -32
401-0610	L101-61	Brass hanger for -12, -29 Floatswitch, custom made to given specs.
462-0123	EV102-3	3/4" Valve Diaphragm
462-0133	EV103-3	1" Valve Diaphragm
462-0143	EV104-4	1 1/4" Valve Diaphragm
462-0153	EV105-5	1 1/2" Valve Diaphragm
462-0163	EV103-6	1" Valve Diaphragm
466-0002	R1240-1	1" Bronze Fill Spout Cover
466-0111	R1241&43	1" x 500mm Stand Pipe, Brass
466-0114	R1244&46	1" x 1000mm Stand Pipe, Brass
466-0211	R1260-1	1 1/2" Bronze Fill Spout Cover
466-0224	R1261&63	1 1/2" x 1000mm Stand Pipe, Brass
466-0224	R1264&66	1 1/2" x 1000mm Stand Pipe, Brass