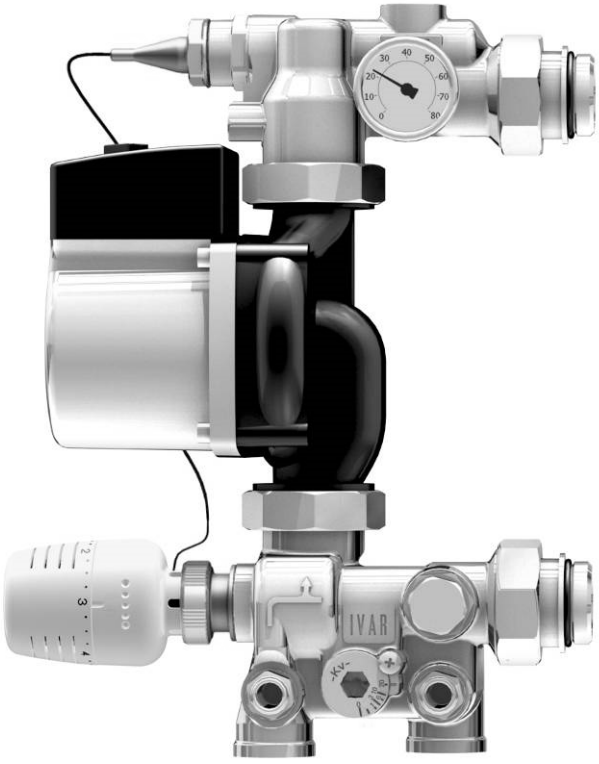
UFH Manifold Mixing Kit User Manual



User Manual

The installation and commissioning of the **UFH mixing kit** system must be exclusively performed by qualified personnel in accordance with the national guidelines and/or the relative local requirements. If the operator must perform any interventions which could pose a risk of direct contact with the boiler fluid, he/she must use adequate personal protection equipment (PPE). It is important that the instructions here provided be followed in order to prevent damage to the system and/or personal injuries.

Conditions of use

Contact fluid: water or water-glycol mixtures
Temperature adjustment range: 30-55 °C / 86-131 °F or 20-60 °C / 68-140 °F
Max operating static pressure: 10 bar / 145 psi
Max primary fluid temperature: 90 °C / 194 °F
Differential overpressure by-pass valve range: 0.2-0.6 bar / 2.9-8.7 psi
Thermometer range: 0-80 °C / 32-176 °F

Materials

Upper and lower bodies: CB753S brass
Other brass components (headwork, shutter, etc.): CW617N brass
Rubber sealing parts: peroxide EPDM
Thermostatic head
- Knob: ABS
- Body: PC and ABS blend
- Ring nut: CW617N brass

Components (ref. Fig. 2)

UFH mixing kit is a distribution unit designed to provide reliable flow temperature control, flexible installation and easy start-up. Available with pre-mounted booster pump (cod. 500897) or with no pump installed (cod. 500897WP).

1. Booster pump (cod. 500897 only)
2. Remote-sensor holder
3. Upper body
4. Lower body
5. Manifold connection fittings (1'')
6. Thermometer
7. Thermostatic headwork + protection cap
8. Primary by-pass valve
9. Secondary by-pass valve
10. Thermostatic head T 5011U or T 5011

Installation instructions

Connections

Please refer to Fig. 1 for size and threads. Fig. 3 shows a typical installation outline. Pay attention to correctly connect the pipes to the system: boiler flow pipe must be connected to **UFH mixing kit** inlet in correspondence of connection (a), while the boiler return pipe must be connected to **UFH mixing kit** outlet in correspondence of connection (b). It is recommended that ball valves are installed between **UFH mixing kit** module and primary piping to allow easy interception during filling and maintenance operations.
Manifold connection fittings are suitable for 1'' manifolds. Flow manifold (FM) must be installed on top, while return manifold (RM) must be connected to the lower outtake. It is recommended that an automatic air vent valve (c), a differential overpressure by-pass (d), a fill tap (e) and a discharge tap (f) are installed as outlined in Fig. 3.

Preliminary check

Before washing, filling and pressurising the plant, it is recommended that the following points are checked:
1. The pump connecting nuts, plugs, probe holders and fittings must be tightened properly;
2. The pump must be installed with upflow direction;
3. Overpressure by-pass on the secondary circuit must be mounted correctly with the black knob placed on the return manifold;
4. Manifolds must be installed correctly: flow manifold must be mounted on top and return manifold on the bottom.

Plant filling

Warning. Fill the plant with clean water, free of impurities and dirt. Check the space temperature before filling: if the temperature is below 6 °C / 42.8 °F, the plant should not be filled unless it is started up immediately in order to prevent pipes from freezing.
Filling operations must be performed for each underfloor circuit separately. With reference to Fig. 3, close the primary valves (a) and (b), and the pump interception valve (g). Perform the following operations:
1. Connect the filling unit to the fill tap (e);
2. Connect an outlet pipe to the discharge tap (f);
3. Block all circuits except the one to be filled, by closing the proper valves on both manifold FM and RM;
4. Start filling operations;

5. Stop filling as soon as air-free water flows out of the outlet pipe;

6. Once the circuit has been filled, block it, then open the next one to be filled.

Repeat steps 4-6 for all the circuit to fill. At the end of filling operations, open valves (a), (b) and (g).

Thermostatic head installation

Mixing valve can be controlled with the included thermostatic head T 5011U or T 5011, allowing for a fixed-point regulation in which the flow temperature, detected by the remote immersion sensor, is kept constant to the value imposed through the command knob.

Mounting

To install the thermostatic head, proceed as follows:

1. Set the head knob fully open: this will make installation easier;
2. Remove the protection cap from the thermostatic headwork;
3. Fit the head to the headwork and screw the brass ring nut manually;
4. Use a 2-mm Allen key to loosen the screw in the remote-sensor holder, then place the sensing bulb into the holder and block it by tightening the screw again.

Locking the setting (Fig. 4)

1. Set the head to the desired temperature (e.g. 40 °C, corresponding to 104 °F);
2. Use a screwdriver to remove the cover (i), the locking cap (ii) and the first of the toothed washers (iii) in Fig. 4a;
3. Reassemble the washer (iii):
    a. as in Fig. 4b to limit the adjustment up to the set value (in the example, 30-to-40 °C, corresponding to 86-to-104 °F);
    b. as in Fig. 4c to lock the setting at the set value (in the example, 40 °C , corresponding to 104 °F);
4. Reassemble the locking cap (ii) and the cover (i).

Adjustment temperatures

See Fig. 4d. Please note that the actual temperature maintained by the device may differ from the value selected by the knob depending on inlet (hot and cold water) conditions.

Installation of additional accessories (not included)

A differential overpressure by-pass valve should be installed between flow and return manifolds to the purpose of opening a by-pass way when pressure difference between flow and return manifolds exceeds the setting value. This prevents damages to the pump in case all the distribution circuits are closed while the pump is still working. The set value should be slightly larger than the design pressure head provided by the pump.
A safety thermostat should be installed on the flow branch to turn off the circulation through the radiant system when flow temperature exceeds a threshold value. The thermostat can be of contact-type or with immersed sensing element. In the first case, it is recommended that it is installed in contact with the flow (upper) manifold. In the second case, the sensing element should be immersed into the flow in a representative position. Thermo-Floor proposes contact safety thermostat with adjustable setting 20-90 °C (68-194 °F) art. AC 614 (see Fig. 7a) and 60 °C (140 °F) fixed-setting thermostat with immersed sensing element art. AC 634 (see Fig. 7b). The latter features ½'' M soft seal connection which makes it suitable to be installed directly to pocket (h) in Fig. 3.
High-temperature manifolds can be installed upstream the mixing valve if a fraction of incoming hot flow must be sent to high-temperature heating bodies such as radiators or towel rails. These manifolds must be connected to outtakes (a) and (b) in Fig. 3. Thermo-Floor provide two models of high temperature manifold kits:

1. Plain high-temperature manifold kit (see Fig. 8a), equipped with a fill/drain tap and differential overpressure by-pass, even in version with ball valves and thermometers.
   Warning. If plain manifolds are used, thermostatic valves should be installed on heating bodies to control each thermal zone independently; in cooling applications, consider to place anti-dew valves on the distribution delivery branches.
2. Interceptable high-temperature manifold kit with micrometric regulation lockshields on flow manifold and shut-off valves on the return one (see Fig. 8b), equipped with fill and drain taps, differential overpressure by-pass and manual air-vent valve, even in the version with primary ball valves and thermometers.
   Warning. If interceptable manifolds are used, electro-thermal heads with auxiliary switch contact can be applied to the return manifold shut-off valves whose opening can be controlled by room thermostats.

Balancing and regulations

The diagrams relative to mixing valve and secondary by-pass can be found in see Fig. 9a and Fig. 9b, respectively. These graphs allow the designer to size the system properly and to provide the installer with the correct settings for each individual component.

Primary by-pass valve

The high temperature primary by-pass allows for a re-circulation of hot water on the return to the boiler. As such, the return water temperature is higher. The by-pass is adjustable from 0 position to “Kv 20”: 0 position indicates completely closed by-pass (see Fig. 5a), while “Kv 20” denotes its

maximum achievable opening (see Fig. 5b). By-pass opening is recommended in presence of boilers requiring re-circulation for optimal operation, and in the event of several **UFH mixing kit** units being installed in the same building and powered by a single boiler. The adjustment of the primary by-pass can be done by loosening the blocking crosshead screw and using a 10-mm Allen key to align the desired value printed on the selector plate to the reference carving. Once the setting has been completed, tighten the crosshead again to block the selector.

Secondary by-pass valve

The secondary by-pass valve can be used to perform a preliminary regulation of the amount of recirculation water flowing to the mixing area. A fine adjustment is performed automatically by the thermostatic head.
The secondary balancing by-pass is equipped with double micrometric adjustment and position memory in the event of temporary closing. To correctly adjust and balance the circuit, apply the following procedure with reference to Fig. 6:

1) Remove the plug;
2) Use a screwdriver to unscrew the dowel screw inside the hexagonal groove, then remove it and put it aside;
3) Use a 5 mm Allen key to close the by-pass completely (Fig. 6a);
4) Put the dowel screw back into the groove, then screw it until mechanical stop. Now mark a reference point with an ‘x’ corresponding to the screw cut (Fig. 6b);
5) Align the screwdriver with the reference, marking a second 'x' on it if necessary (Fig. 6c); then unscrew the dowel by the correct number of turns according to the diagram Δp-Q relative to the secondary by-pass reported in Fig. 9b: this operation will set the upper opening limit with position memory. Please note the number of turns here indicates the number of opening turns that the dowel screw should be unscrewed by, starting from complete closure;
6) Open the by-pass completely by using the 5 mm Allen key until mechanical stop (Fig. 6d). It will now be possible to close the by-pass completely, but not to open it beyond the upper limit set by the dowel screw adjustment;
7) Put the plug back on the element.

If no Kv data are available, a rough adjustment of the secondary by-pass valve can be done as follows:

- Leave the 3-way mixing valve fully open, without assembling the thermostatic head;
- Remove the dowel screw from the hexagonal groove, then use a 5-mm Allen key to open the by-pass completely;
- once you have checked that the boiler water has reached the set temperature, allow the water to circulate through the plant and monitor the flow temperature value by means of the temperature gauge. Three possible cases may occur:
  A. flow temperature complies with that of the design: calibration is complete;
  B. flow temperature is lower than design value: start closing the secondary balance by-pass until the flow temperature has reached the design value;
  C. flow temperature is greater than that of the design: in this case, if possible, reduce the temperature set at the boiler, and then continue with calibration. Alternatively, mount the thermostatic head or motor, which act on the mixing valve allowing you to reach the temperature set, or gradually open the primary by-pass until you read the desired temperature on the secondary thermometer.

Circulator pump

The booster pump supplied with **UFH mixing kit** is a standard in-line three-speed circulator, 1 ½'' connections and 130-mm port-to-port length. Hydraulic features and power consumption are reported in Fig. 10a and Fig. 10b, respectively.

Technical features

Model: Grundfos UPSO 25-55 130
Supply voltage: 230 VAC
Max operating pressure: 10 bar
Ingress protection: IP 44
Temperature class: TF 110

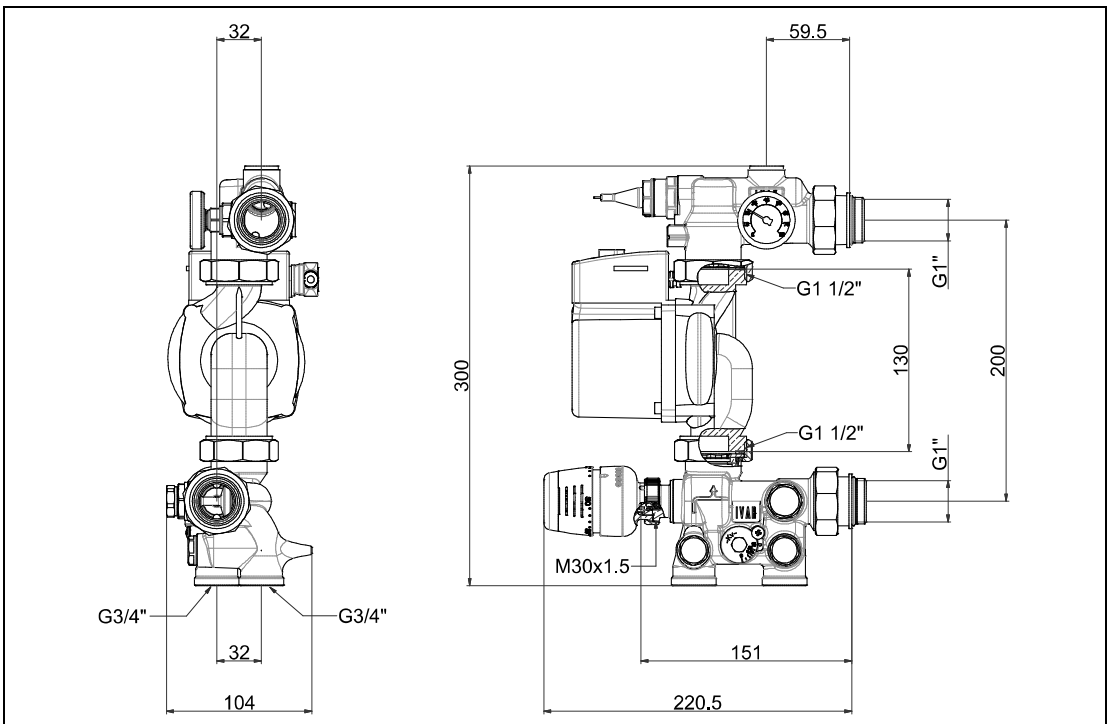

32
59.5
G1 1/2"
G1"
130
200
300
G1 1/2"
G1"
M30x1.5
G3/4"
G3/4"
32
104
151
220.5

Fig. 1

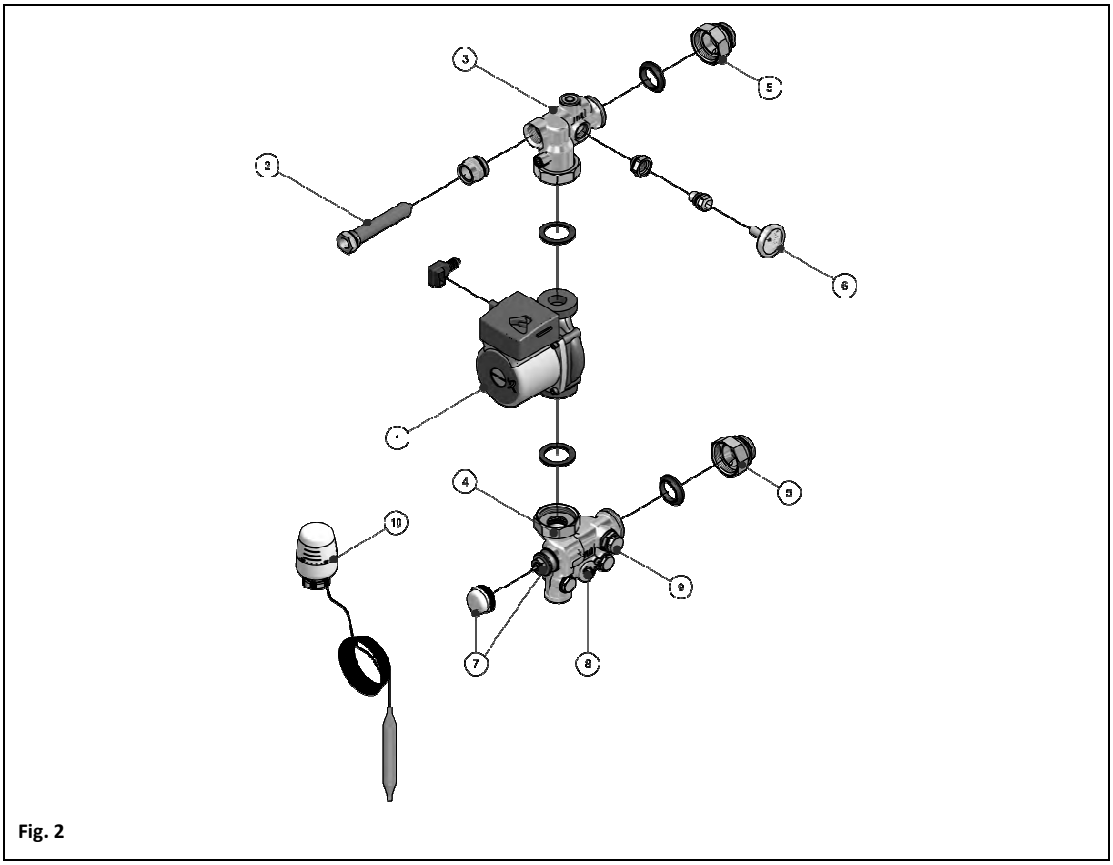

3
5
2
6
1
4
9
10
9
7
8

Fig. 2

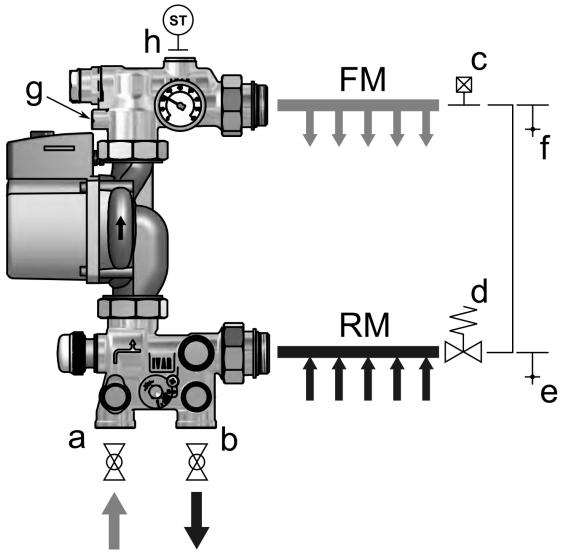
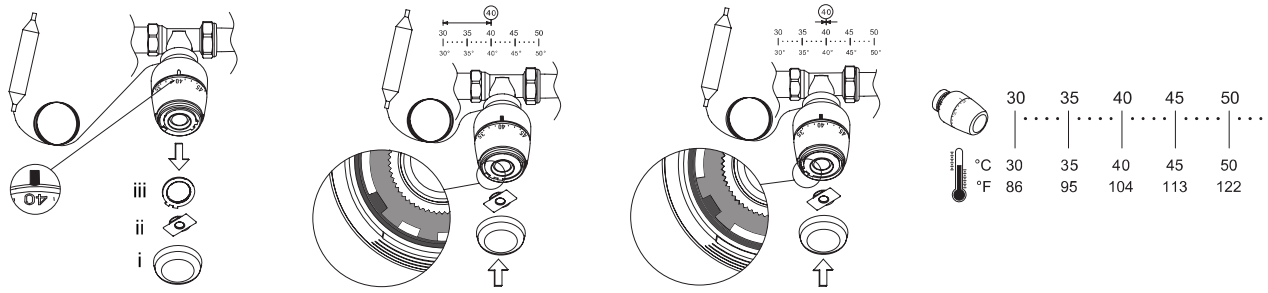
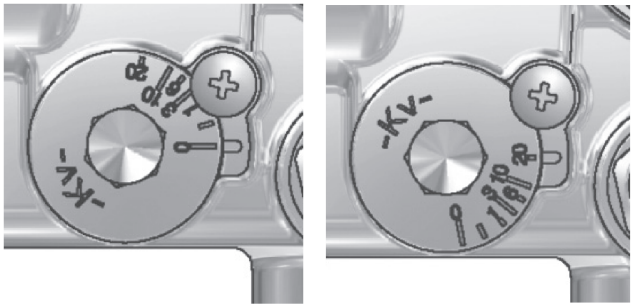


Fig. 3



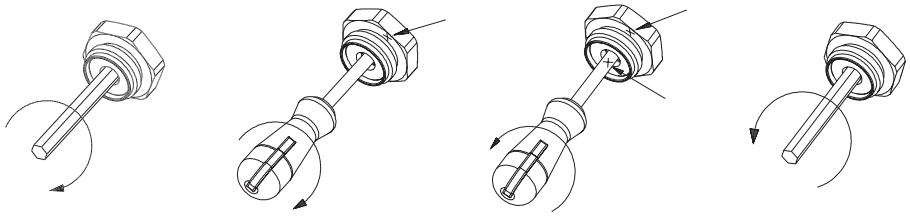
(a) (b) (c) (d)

Fig. 4



(a) (b)

Fig. 5

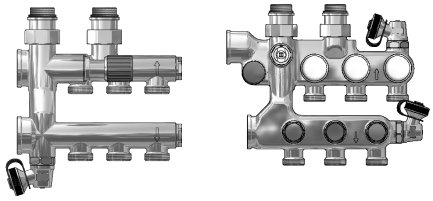


(a) (b) (c) (d)

Fig. 6

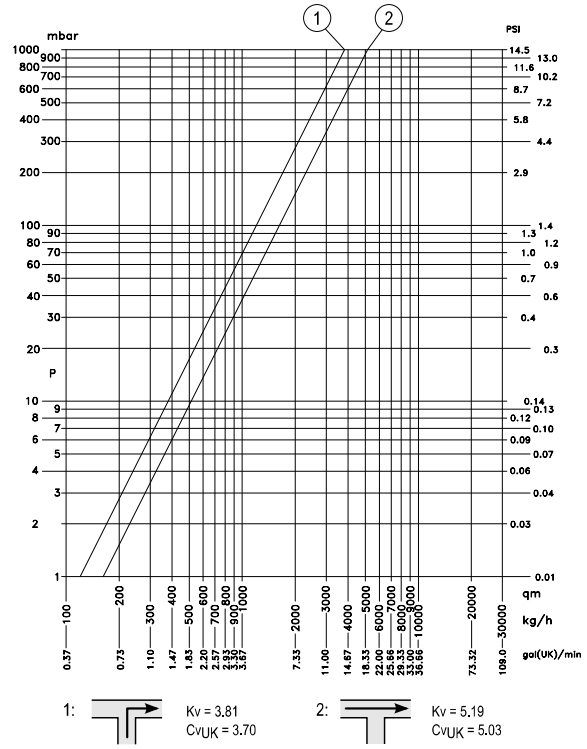
(a) (b)

Fig. 7

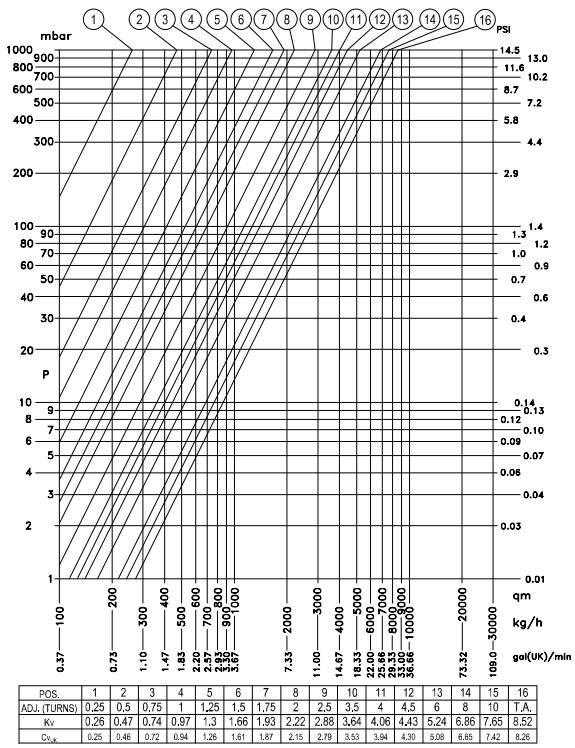


(a) (b)

Fig. 8



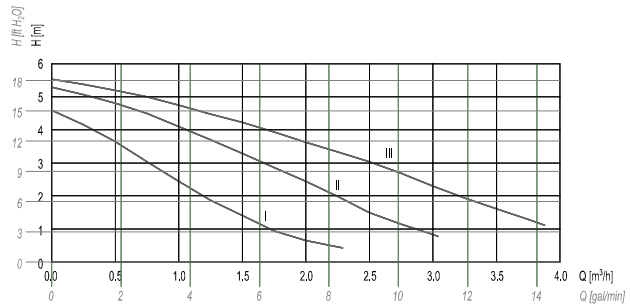
(a)



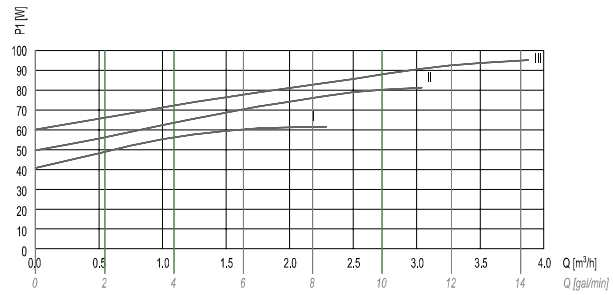
POS.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ADJ. (TURNS)	0,25	0,5	0,75	1	1,25	1,5	1,75	2	2,5	3,5	4	4,5	6	8	10	T.A.
Kv	0.26	0.47	0.74	0.97	1.3	1.66	1.93	2.22	2.88	3.64	4.06	4.43	5.24	6.86	7.65	8.52
Cv_{UK}	0.25	0.46	0.72	0.94	1.26	1.61	1.87	2.15	2.79	3.53	3.94	4.30	5.08	6.65	7.42	8.26

(b)

Fig. 9



(a)



(b)

Fig. 10

Notes

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SUPPLIES