

# GRUNDFOS iGRID TEMPERATURE ZONE

## DESIGN AND CONFIGURATION GUIDE

### GRUNDFOS iSOLUTIONS



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# GRUNDFOS iGRID TEMPERATURE ZONE: INTRODUCTION

Heat losses from District Heating distribution networks are largely linked to the temperature of the pumped medium in supply and return lines. Often the maximum flow temperature is determined by the area with the highest demand, but this temperature may be excessive for other, less heat demanding areas of the grid.

The Grundfos iGRID Temperature Zone enables lowering of the supply temperature to less demanding zones, based either on the actual demand or pre-set temperature, relevant to the controlled zone. This solution lowers the supply temperature into the controlled zone by mixing of the cooler medium from the return line into the supply line.

See the Grundfos iGRID Temperature Zones brochure for more information about supply and return temperatures in the pipes for District Heating distribution networks.

## WHY USE iGRID TEMPERATURE ZONE?

Benefits from lowering the supply temperature with iGRID Temperature Zone include:

- Reduced heat losses – typically 20-30%
- Improved capacity in the main grid
- Possibility of connecting renewable energy sources
- Reduction of carbon emissions
- Better temperature control resulting in better grid performance
- Higher efficiency in the production plant due to lower return temperatures
- Lower pressure loss in the main part of the grid
- Better pressure control when combined with a booster pump

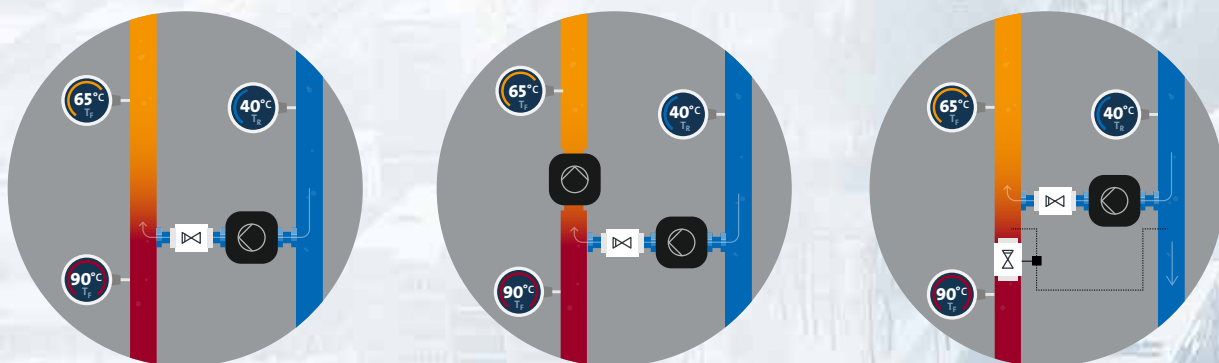
## iGRID TEMPERATURE ZONE OVERVIEW

iGRID Temperature Zone is a prefabricated mixing loop that can be delivered in a pit, cabinet or on a skid. The solution consists of:

- Bypass connecting return to supply line
- Variable speed mixing pump controlled by the temperature in supply to the zone
- Sensors (temperature, pressure, flow)

iGRID Temperature Zone is available in three functional design options which can be configured from standard components:

- **Shunt solution**
  - bypass with mixing pump
- **Free flow**
  - shunt solution with additional pump in supply line to the zone to boost the pressure
- **Pressure reduction**
  - shunt solution with pressure control valve where reduction of pressure to the zone is required





# DESIGN OPTIONS

iGRID Temperature Zones are delivered with the following pre-assembled components as standard:

- Insulated inlet and outlet connection pipes
- Isolating valves
- Non-return valves
- Pump (or pumps) including control unit
- Temperature sensors
- Pressure sensors

## iGRID TEMPERATURE ZONE PIPEWORK OPTIONS:

**1. STANDARD OPTION (3-PIPE DESIGN)** consists of 3 configurable pipework lines:

- High Temperature – supply line from the grid to mixing point
- Bypass – supply of cooler water from return to supply line
- Low temperature – supply line to the zone from the mixing point

## 2. LEAK DETECTION OPTION (4-PIPE DESIGN)

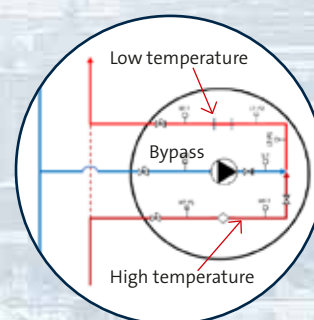
The leak detection option includes a flow meter in the return line. This option requires an alternative pipework layout, as well as a flow meter in the supply line.

## 3. CUSTOM CONFIGURATION

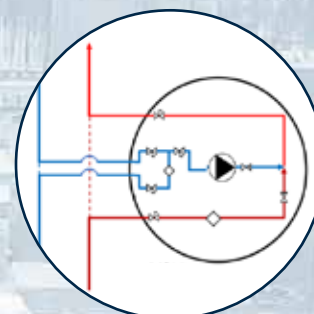
This option enables use of larger diameter pipework (above DN125), and multiple pumps in duty sharing arrangement.

## iGRID T-ZONE ENCLOSURE OPTIONS:

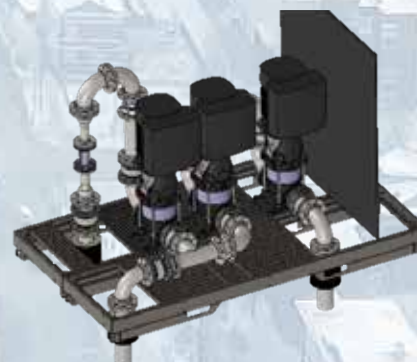
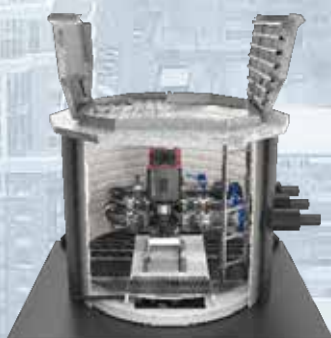
- **Prefabricated pit** - for installation in the ground. Compact solution with minimum above ground space requirement. Delivered to site in CE marked 2000mm diameter, PE (polyethylene) well with a drainage sump pump and access ladder
- **Prefabricated cabinet** - for above ground installation. Hot-galvanised steel frame with powder-coated aluminium covers and doors, soundproofed with foam panels.
- **Packaged skid** - frame without enclosure for indoor installation. Enables installation of larger or multiple pumps (custom option). After factory test, supplied as components for re-assembly on site



STANDARD 3-PIPE



LEAK DETECTION



# GRUNDFOS iGRID TEMPERATURE ZONE: **COMPONENTS**



	CRE	TPE-2000	TPE.3
DN 150	CRE 155, CRE 125	TPE 150 S	
DN 125		TPE 125 S	
DN 100	CRE 95, CRE 64	TPE 100 S	TPE3 100
DN 80	CRE 45	TPE 80 S	TPE3 80
DN 65	CRE 32	TPE 65 S	TPE3 65
DN 50	CRE 20, CRE 15	TPE 50 S	TPE3 50
DN 40	CRE 10	TPE 40 S	TPE3 40
DN 32			

Leak detection option – only TPE3 40



	Grundfos	Grundfos (+Temp)	Siemens
DN 150			SITRANS FM 5100
DN 125			SITRANS FM 5100
DN 100	VFI 12-240, 020 E	VFI+T 12-240, 020 E	SITRANS FM 5100
DN 80	VFI 8-160, 020 E	VFI+T 8-160, 020 E	SITRANS FM 5100
DN 65	VFI 5.2-104, 020 E	VFI+T 5.2-104, 020 E	SITRANS FM 5100
DN 50	VFI 3.2-64, 020 E	VFI+T 3.2-64, 020 E	



Range	Pressure sensor
0-16 bar	iGRID pressure sensor MBS 3200



Range	Temperature sensor
0-150°C	PT1000 sensor with insertion tube

## Fitting pieces

Fitting Piece with static mixer

Fitting Piece without static mixer

NOTE: Alternative fitting:

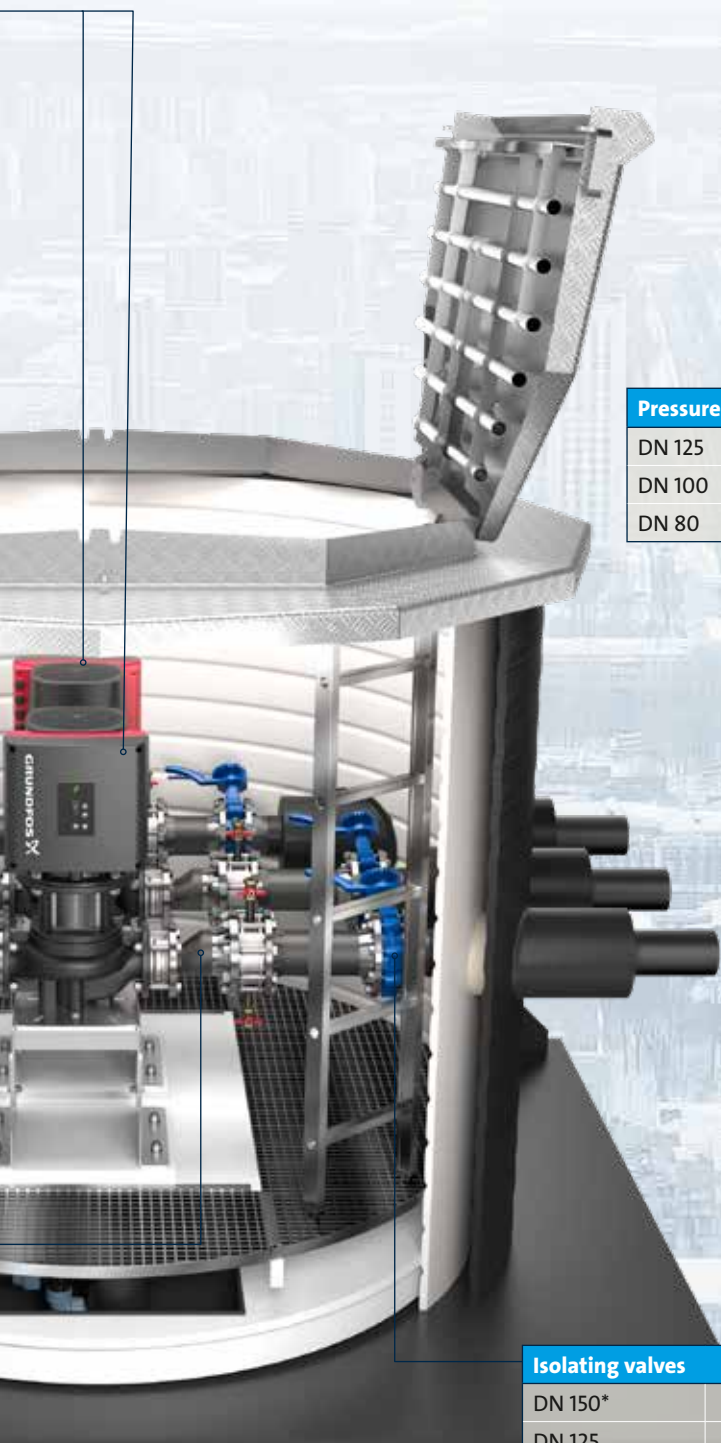
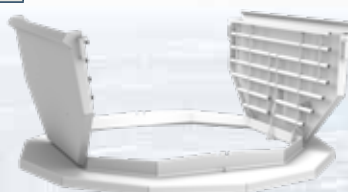
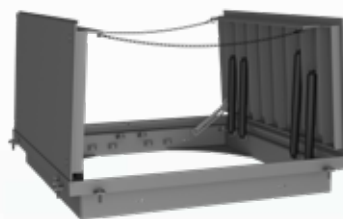
- when flow meter or pressure control valve are not required
- fitting piece with static mixer is only in use if no booster pump



#### Pit cover

Heavy duty Ø2000

Aluminium (standard) Ø2000



#### Pressure control valve

DN 125	Pressure control valve DN125
DN 100	Pressure control valve DN100
DN 80	Pressure control valve DN80



#### Leak Detection line

DN 125	iGRID Leak Detection line DN125
DN 100	iGRID Leak Detection line DN100
DN 80	iGRID Leak Detection line DN80

#### Standard pipe

DN 150*
DN 125
DN 100
DN 80

#### Isolating valves

DN 150*	Butterfly valve	Ball valve
DN 125	Butterfly valve	Ball valve
DN 100	Butterfly valve	Ball valve
DN 80	Butterfly valve	Ball valve



\* - Maximum pipe size depends on the solution (pit, cabinet or skid)

# CONFIGURATION OPTIONS

Select options from the standard component range and configure your iGRID Temperature Zone.

## Pipework options:

- Pipe size (connection side)
- Isolating (shut off) valves
- Pipework design (3 or 4 pipe)

## High temperature line options

- Flow sensor
- Pressure control valve
- Temperature sensor
- Pressure sensor

## Bypass line options

- Pump model
- Temperature sensor
- Pressure sensor

## Low temperature line options

- Pump model
- Temperature sensor
- Pressure sensor

## Customisation

If the required solution cannot be configured based on standard components, bespoke design options are also available.

Contact your local Grundfos sales office.

Custom options could include:

- Pipework size beyond configurable options
- Multiple shunt or booster pumps
- Bespoke skid-based solution

## Accessories

- Heavy duty pit cover
- Pipe insulation
- iGRID Temperature Optimiser controller
- Building measure point
- Pit measure point
- Building bypass

## ACCESSORIES AND CONTROL OPTIONS

To further optimise the system performance, you can place the following accessories in the iGRID Temperature Zone controlled part of the grid.



### iGRID Temperature Optimiser

Optimising the supply temperature and pressure with weather compensation (requires external weather station), peak shaving algorithms and real-time data from the iGRID Pit Measure Point.



### iGRID Pit Measure Point

Real-time measurement of pressure and temperature in the grid, without the need of connecting to a power supply (powered by integral thermal electric generator). Measured data is transmitted via GSM

General configuration and accessories	
Pipe size (connection side)	DN125, DN100, DN80
Leak detection design option	DN125, DN100, DN80
Isolating (shut off) Valves	Butterfly or Ball valves, DN80 to DN150
Pit cover	Heavy duty cap Ø2000 Aluminium cap Ø2000
Pipe insulation	DN125, DN100, DN80
Control and communication options	iGRID Temperature Optimiser (Software and hardware) iGRID Building Measurepoint - 6 Bar iGRID Pit Measurepoint - 10 Bar iGRID Building Bypass - 6 Bar

High temperature, Low temperature and Bypass line configuration options			
	High temperature line options	Low temperature line options	Bypass line options
Pump model	N / A	- CRE 10 to CRE 155 (DN40 to DN150) - TPE 2000 (DN40 to DN 200) - TPE3 (DN40 to DN100) - Leak detection option can only use TPE3_40	
Flow sensor	Grundfos VFI, DN50 to DN100 Grundfos VFI+T, DN50 to DN100 Siemens SITRANS, DN65 to DN150 Alternative fitting piece		N / A
Pressure control valve	DN100, DN125 Alternative fittings (with or without static mixer)	N / A	
Temperature sensor	PT1000 sensor with insertion tube, 0-150°C		
Pressure sensor	iGRID P-sensor MBS 3200		



#### iGRID Building Measure Point

Real-time measurement of pressure and temperature in the building part of the grid. The device is powered from the building power supply. Measured data is transmitted via GSM



#### iGRID Building Bypass

Securing instant hot water for the building with minimum impact on return temperatures and the possibility to remotely close the valve during low demand (weekends or holidays)

### GRUNDFOS iGRID - A SOLUTION RANGE FOR DISTRICT HEATING

With this range we fight heat losses and prepare for utilisation of renewable energy sources through intelligent temperature control. By creating city zones with mixing loops, temperatures can be lowered to meet the actual demands in those zones and thereby deliver exactly the heat energy needed – nothing more and nothing less.

**Find out more about Grundfos iGRID solutions by contacting your local Grundfos sales company.**

