Toro W sealed room

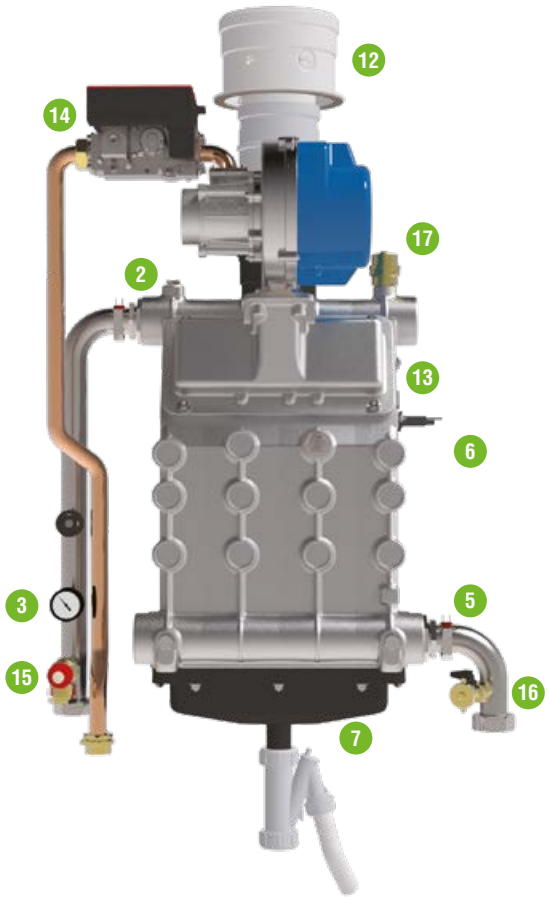
High power condensing modules for cascade installation

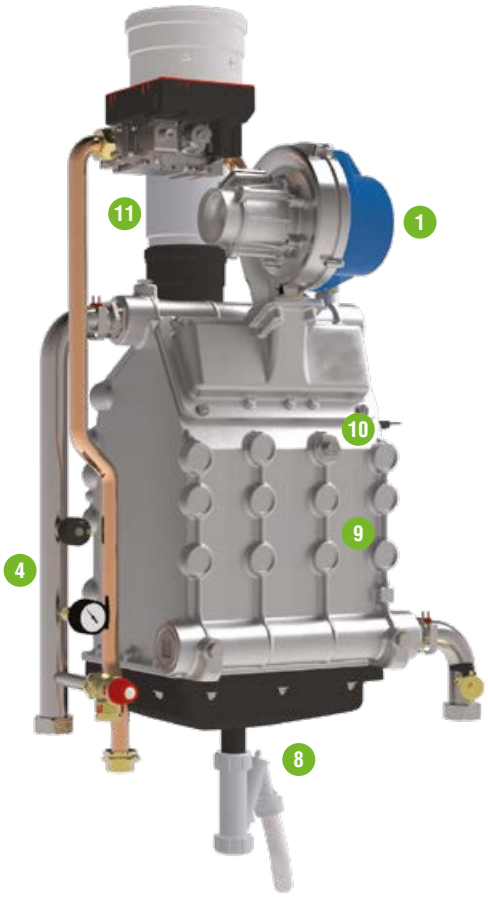
- High power condensing thermal module, designed for single installations or in sequence up to 600 kW
- Hydraulic, gas and flue gas accessories for cascade installation, with 2, 3 and 4 modules
- Pre-assembled heat exchanger with elements in aluminum-silicon alloy engineered for the maximum efficiency and minimum pressure drops on the water circuit
- Total pre-mixing unit, for a micro-flame combustion with very low polluting emissions (Class 6 according to EN 15502-1). The metal micro-fiber burner can run on Natural gas or LPG
- Generator protection systems:
  * Double sensor (delivery and return) system to operate at constant ΔT
  * Exchanger overtemperature protection sensor calibrated to 95°C
  * Flue gas safety sensor
  * Water pressure switch with minimum limit of 0,8 bar
- Hydraulic unit (supplied as accessory) with three-way valve for discharge into the atmosphere and a no-return valve. It's possible choosing between two circulators, standard and high head
- Sealed room air/flue gas circuit and check valve on the flue gas ejection duct to design the pressurised manifold
- Master / Slave cascade management with self-configuration system and possibility of setting the on/off sequence of the single generator.
- The electronic control on board is design to manage a double system zone and one DHW storage. In combination with the regulator FZ4 B the boiler can manage different temperature zone (direct and mixed)
- Range Rated certified generator to adjust the generated power to the system's needs by increasing the efficiency of the system and preserving the mechanics of the machine.
- The modules can be controlled and conducted remotely:
  * Power or temperature adjustment with 0 - 10V signal
  * Blocking alarm signal for safety and to restart operation
  * Opentherm (OT) and Modbus communication protocols with settable parameters

Boiler code	Boiler model
0MDSAAWD	**TORO W 60**
0MDSCAWD	**TORO W 80**
0MDSDAWD	**TORO W 99**
0MDSEAWD	**TORO W 120**
0MDSFAWD	**TORO W 150**

Model			**W 60**	**W 80**	**W 99**	**W 120**	**W 150**
ERP Class		(Class G - A++)	A	-	-	-	-
Heating heat input	Max / Min	kW	58.0 / 15.0	74.4 / 15.0	96.6 / 19.0	113.0 / 19.0	159.0 / 24.0
Heating heat output 80°C-60°C Effective heating output 50°C-30°C	Max / Min Max / Min	kW kW	57.0 / 14.7 60.8 / 16.3	72.9 / 14.7 77.0 / 16.3	94.7 / 18.7 100.0 / 20.5	110.5 / 18.7 117.0 / 20.5	140.0 / 23.6 148.0 / 25.9
Efficiency	80°C-60°C 50°C-30°C 30% partial load	Pmax % / Pmin % Pmax % / Pmin % Pmax %	98.3 / 98.3 104.8 / 108.5 108.6	98.0 / 98.3 103.5 / 108.5 108.6	98.0 / 98.3 103.5 / 108.5 108.1	97.8 / 98.3 103.5 / 108.0 108.1	97.8 / 98.3 103.5 / 108.0 108.1
NOx emissions class			6	6	6	6	6
NOx (O_2=0%) weighted		mg/kWh	50	54	39	38	40
CO (O_2=0%) weighted		mg/kWh	75	85	49	50	50
Heating operating pressure	Max / Min	bar	6 / 0.8	6 / 0.8	6 / 0.8	6 / 0.8	6 / 0.8
Water volume		l	4.2	4.2	5.6	5.6	6.7
Empty weight		kg	67	67	76	76	86

Components description





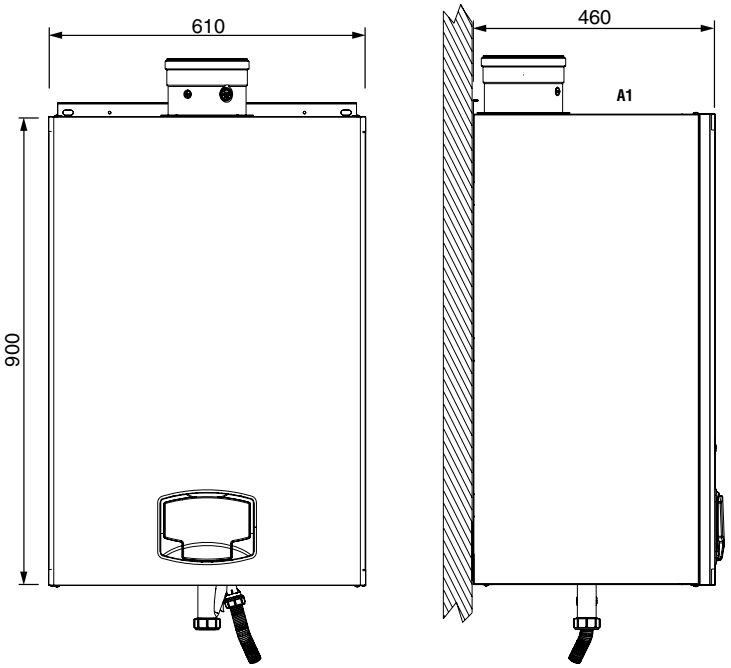
1. Fan
2. C.H. flow temperature sensor
3. Manometer
4. Water pressure switch
5. C.H. return temperature sensor
6. Ignition/Ionisation electrode
7. Gas flue temperature thermostat
8. Condensate drain
9. Aluminium heat exchanger
10. Safety sensors
11. Anti return flue gas valves
12. Gas flue analisys
13. Low NOx burners
14. Flame electronic control - gas
15. Hydraulic safety valve - 6 bar
16. Boiler drain
17. Automatic air vent

Accessories on demand

	042070X0	low-consumption modulating circulator Head 7 m
	042071X0	low-consumption modulating circulator Head 10 m
	042072X0	**system hydraulic kit:** 1 x MF 1"1/2 cock, 1 x 3-way T 1" 1/2 cock, 1 x 1" 1/2 check valve, 1 x MM
	013017X0	kit for management with thermostat (not supplied) of a dhw storage tank (for heating only boilers)
	1KWMA11W	additional sensor for storage tank and/or system flow for cascade - cable 2 mt
	043005X0	additional sensor for storage tank and/or system flow for cascade - cable 5 mt
	013018X0	outdoor probe
	1KWMA29K	ø 100 flue gas terminal
	-	**Temperature controls** in chapter on **SYSTEM COMPONENTS**

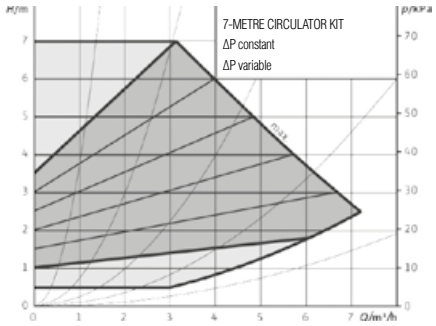
	041107X0	90° coaxial bend, 360° swivel with 45° pitch ø 100/150 mm
	041108X0	1 mt concentric extension Ø 100/150 mm
	041109X0	0,5 mt concentric extension Ø 100/150 mm
	041110X0	1 mt concentric horizontal terminal pipe, Ø 100/150 mm Included wall gasket Ø 150 mm
	041111X0	1 mt concentric vertical terminal pipe, Ø 100/150 mm
	041112X0	wall gasket Ø 150 mm
	041077X0	90° bend kit in pps ø 100 mm
	041073X0	1 m pps ø 100 mm MF flue gas duct kit
	-	neutralisers (see chapter on condensation neutralisers for condensing boilers)

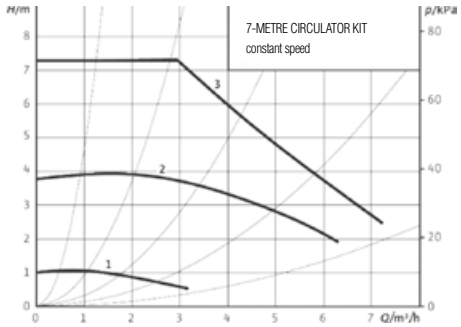
Dimensions and connections / Head flow rate curves



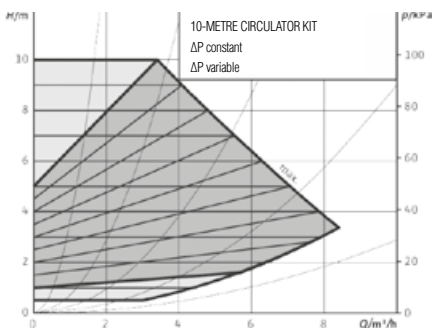
7	Gas inlet - male	Ø 3/4
10	Heating system flow - male	Ø 1" 1/2
11	Heating system return - male	Ø 1" 1/2
A6	Condensate discharge	-
A1	Flue gas outlet	Ø 100/150 mm

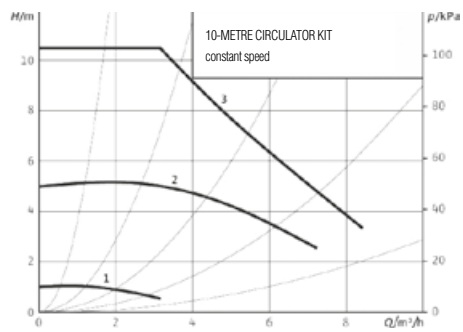
CIRCULATOR KIT 7 m





CIRCULATOR KIT 10 m





Cascade installation

ACCESSORIES
NECESSARY TO CORRECTLY INSTALL TORO W GENERATORS IN A BANK

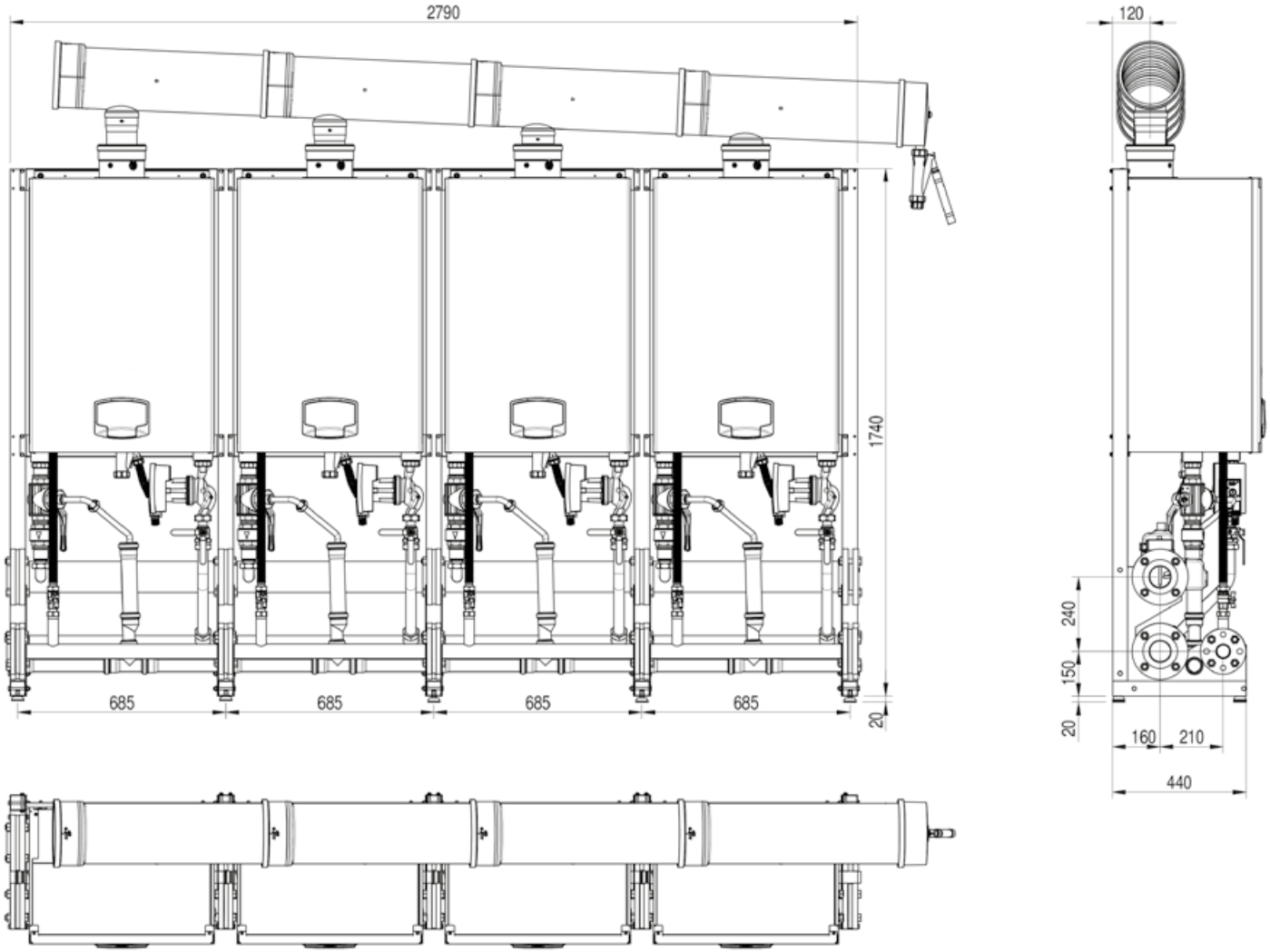
							6	7	1		2	3	4	8	9
							Self-standing frame (start) *	Self-standing frame (extension)	7-m modulating circulator	10-m modulating circulator	hydraulic kit: 1 x MF 1"1/2 cock, 1 x 3-way T 1" 1/2 cock, 1 x 1" 1/2 check valve, 1 x MM	hydraulic (DN65 delivery and return), gas (DN40) manifolds kit for bank installation	Blind flange kit DN65	Flue gas manifold starter kit (Ø 200 mm) *	Flue gas manifold extension kit (Ø 200 mm) *
P_{out} (50/30°C)	MODULES TORO W					Tot. modules									
	60	80	99	120	150		042076X0	042077X0	042070X0	042071X0	042072X0	042074X0	042073X0	041091X0	041092X0
62	1					1	1	-	1	1	1	1	1	-	-
77		1				1	1	-	1	1	1	1	1	-	-
98			1			1	1	-	1	1	1	1	1	-	-
117				1		1	1	-	1	1	1	1	1	-	-
148					1	1	1	-	1	1	1	1	1	-	-
124	2					2	1	1	2	2	2	2	1	1	2
139	1	1				2	1	1	2	2	2	2	1	1	2
154		2				2	1	1	2	2	2	2	1	1	2
179	1			1		2	1	1	2	2	2	2	1	1	2
194		1		1		2	1	1	2	2	2	2	1	1	2
215			1	1		2	1	1	2	2	2	2	1	1	2
234				2		2	1	1	2	2	2	2	1	1	2
265				1	1	2	1	1	2	2	2	2	1	1	2
296					2	2	1	1	2	2	2	2	1	1	2
332			1	2		3	1	2	3	3	3	3	1	1	3
351				3		3	1	2	3	3	3	3	1	1	3
373		1			2	3	1	2	3	3	3	3	1	1	3
394			1		2	3	1	2	3	3	3	3	1	1	3
413				1	2	3	1	2	3	3	3	3	1	1	3
444					3	3	1	2	3	3	3	3	1	1	3
468				4		4	1	3	4	4	4	4	1	1	4
530				2	2	4	1	3	4	4	4	4	1	1	4
561				1	3	4	1	3	4	4	4	4	1	1	4
592					4	4	1	3	4	4	4	4	1	1	4

* * Flue gas accessories certified for installation in a utility room or in a protected place

ACCESSORIES
UPON REQUEST FOR CONFIGURATION ACCORDING TO PROJECT SPECIFICATIONS

1KWMA11W	additional sensor for storage tank and/or system flow for cascade configurations with and without hydraulic separator - 2 mt
043005X0	additional sensor for storage tank and/or system flow for cascade configurations with and without hydraulic separator - 5 mt
013018X0	outdoor probe
042086X0	hydraulic separator DN 32. For installation until 150 kW. The installer is responsible for the connection with the generator
042078X0	hydraulic separator DN 65. For installation from 151 kW to 300 kW
042079X0	installation kit for hydraulic separator. For installation from 151 kW to 300 kW
042080X0	hydraulic separator DN 65. For installation from 301 kW to 600 kW
042081X0	installation kit for hydraulic separator. For installation from 301 kW to 600 kW
-	gasketed plates heat exchanger. The hydraulic connection between the generator and the exchanger is the responsibility of the installer.
-	Temperature controls
-	neutralisers (see chapter on condensation neutralisers for condensing boilers)

Dimensions and connections

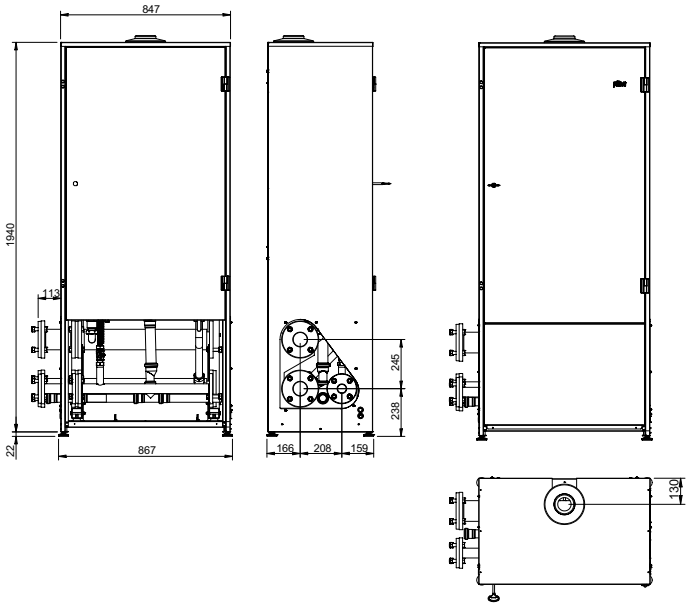


CASCADE KIT FITTINGS

- Delivery/return manifolds DN65 PN16
- Gas manifold DN40 PN16
- Condensation discharge manifold Ø 40 mm
- Flue gas manifold Ø 200 mm

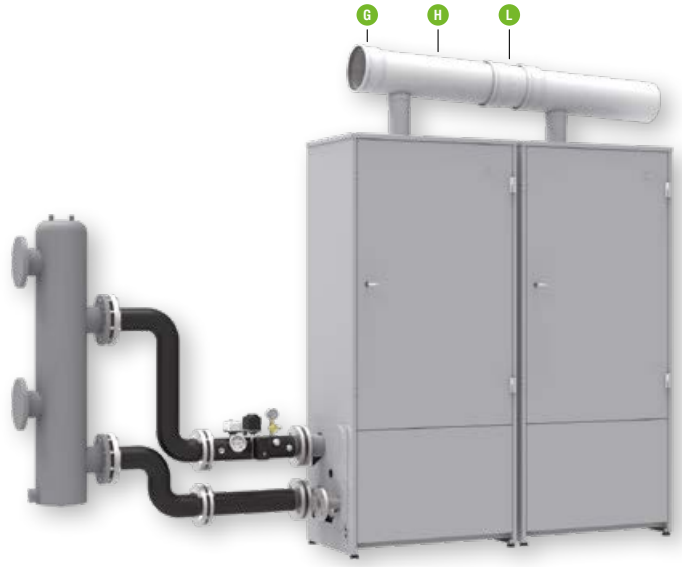
Outdoor installation kit

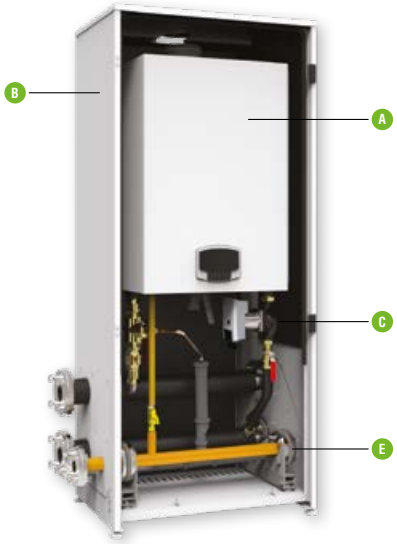
- Cabinet equipped for installing of the TORO W boilers outdoors in a single or bank configuration up to 600 kW
- The cabinet can be combined with one of five models from the TORO W range and one of the two circulators (7 m and 10 m head)
- Standard equipment includes:
  * Support frame for the TORO W thermal generator
  * DN 65 system delivery and return manifolds
  * DN 40 gas manifold
  * Flanged system fittings kit
  * Condensate collection and drain manifold
  * Three-way shut-off valve with discharge into the atmosphere
  * Two-way shut-off valve
  * Check valve
  * Gas connection pipe between boilers and manifold with shut-off valve
- All optional kits are available for single or bank installation up to four modules in line.
- The generator combined with the cabinet kit can be installed without any protection against bad weather (IPX5D) and down to temperatures of -5°C



MODEL			W60		W80		W99		W120		W150	
ERP class		(Class G - A+)	A		-		-		-		-	
Nominal power input	Max/Min	kW	58.0 / 15.0		74.4 / 15.0		96.6 / 19.0		113.0 / 19.0		143.0 / 24.0	
Nominal power output 80°C-60°C Nominal power output 50°C-30°C	Max/Min Max/Min	kW kW	57 / 14.7 60.8 / 16.3		72.9 / 14.7 77.0 / 16.3		94.7 / 18.7 100.0 / 20.5		110.5 / 18.7 117.0 / 20.5		140.0 / 23.6 148.0 / 25.9	
Thermal module TORO W			0MDSAAWD		0MDSCAWD		0MDSDAWD		0MDSEAWD		0MDSFAWD	
Technical external cabinet			046058X0		046058X0		046058X0		046058X0		046058X0	
High performance modulating pump (7 mt)			042070X0	-	042070X0	-	042070X0	-	042070X0	-	042070X0	-
High performance modulating pump (10 mt)			-	042071X0	-	042071X0	-	042071X0	-	042071X0	-	042071X0

Cascade installation for outdoors





ACCESSORIES
NECESSARY TO CORRECTLY INSTALL TORO W GENERATORS IN A BANK

	A						B	C		E	G	H	L	
							Technical cabinet equipped for outdoors	7-m modulating circulator	10-m modulating circulator	Blind flange kit DN65	Flue gas manifold starter kit (Ø 200 mm) *	Flue gas manifold extension kit (Ø 200 mm) *	Flue manifold adapter F 200 mm	Smoke chimney F 100 mm (for unprotected roof installations)
P_{opt} (50/30°C)	MODULES TORO W					Tot. modules								
	60	80	99	120	150		046058X0	042070X0	042071X0	042073X0	041091X0	041092X0	041093X0	041094X0
62	1					1	1	1	1	1	-	-	-	1
77		1				1	1	1	1	1	-	-	-	1
98			1			1	1	1	1	1	-	-	-	1
117				1		1	1	1	1	1	-	-	-	1
148					1	1	1	1	1	1	-	-	-	1
124	2					2	2	2	2	1	1	2	1	2
139	1	1				2	2	2	2	1	1	2	1	2
154		2				2	2	2	2	1	1	2	1	2
179	1			1		2	2	2	2	1	1	2	1	2
194		1		1		2	2	2	2	1	1	2	1	2
215			1	1		2	2	2	2	1	1	2	1	2
234				2		2	2	2	2	1	1	2	1	2
265				1	1	2	2	2	2	1	1	2	1	2
296					2	2	2	2	2	1	1	2	1	2
332			1	2		3	3	3	3	1	1	3	2	3
351				3		3	3	3	3	1	1	3	2	3
373		1			2	3	3	3	3	1	1	3	2	3
394			1		2	3	3	3	3	1	1	3	2	3
413				1	2	3	3	3	3	1	1	3	2	3
444					3	3	3	3	3	1	1	3	2	3
468				4		4	4	4	4	1	1	4	3	4
530				2	2	4	4	4	4	1	1	4	3	4
561				1	3	4	4	4	4	1	1	4	3	4
592					4	4	4	4	4	1	1	4	3	4

* Flue gas accessories certified for installation in a utility room or in a protected place

ACCESSORIES
UPON REQUEST FOR CONFIGURATION ACCORDING TO PROJECT SPECIFICATIONS

1KWMA11W	additional sensor for storage tank and/or system flow for cascade configurations with and without hydraulic separator - 2 mt
043005X0	additional sensor for storage tank and/or system flow for cascade configurations with and without hydraulic separator - 5 mt
013018X0	outdoor probe
046060X0	single empty cabinet for outdoors
046061X0	double empty cabinet for outdoors
042086X0	hydraulic separator DN 32. For installation until 150 kW. The installer is responsible for the connection with the generator
042078X0	hydraulic separator DN 65 For installation from 151 kW to 300 kW
042079X0	installation kit for hydraulic separator. For installation from 151 kW to 300 kW
042080X0	hydraulic separator DN 65 For installation from 301 kW to 600 kW
042081X0	installation kit for hydraulic separator. For installation from 301 kW to 600 kW
-	gasketed plates heat exchanger. The hydraulic connection between the generator and the exchanger is the responsibility of the installer.
-	see chapter on accessories
-	neutralisers (see chapter on condensation neutralisers for condensing boilers)

Hydraulic separator choice

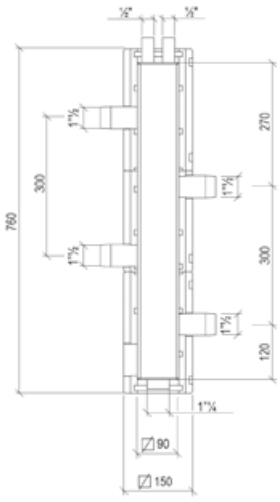
The hydraulic separator guarantees independence between the primary circuit (generator) and the secondary circuit (system) without any disturbance or interference between them.
The separator is proposed complete with deaerator, sludge separator and is fully insulated.

CHARACTERISTICS:
Max operating pressure: 6 bar
Temperature range: 0 - 100°C
Fittings: DN 32 / DN 65 / DN 100

Hydraulic separator

(for installations up to 150 kW)

	DESCRIPTION	CODE
	Hydraulic separator DN 32 The installer is responsible for the connection with the generator	042086X0



Hydraulic separator

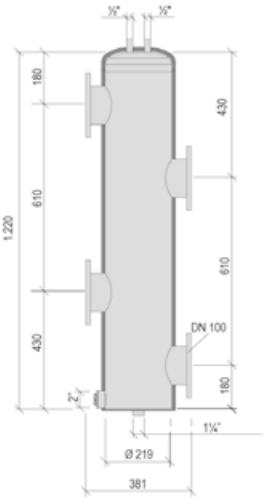
(for installations from 151 kW to 300 kW)

	DESCRIPTION	CODE
	Hydraulic separator DN 65	042078X0
	Hydraulic separator installation kit	042079X0

Hydraulic separator

(for installations from 301 kW to 600 kW)

	DESCRIPTION	CODE
	Hydraulic separator DN 100	042080X0
	Hydraulic separator installation kit	042081X0



MODEL		DN 32	DN 65	DN 100
Flow rate	m³/h	6.5	18	30
Water content	lt	4.8	21	46
Max temperature	°C	100	100	100
Max pressure	bar	6	6	6
Material	-	ST37.1 stainless	ST37.1 stainless	ST37.1 stainless
Insulation	-	Black EPP - 40 g/l	Black EPP - 40 g/l	Black EPP - 40 g/l