



# ITT

Lowara

## TLC Series

Wet rotor Circulators for  
Heating, Cooling and Sanitary systems

**50 Hz**



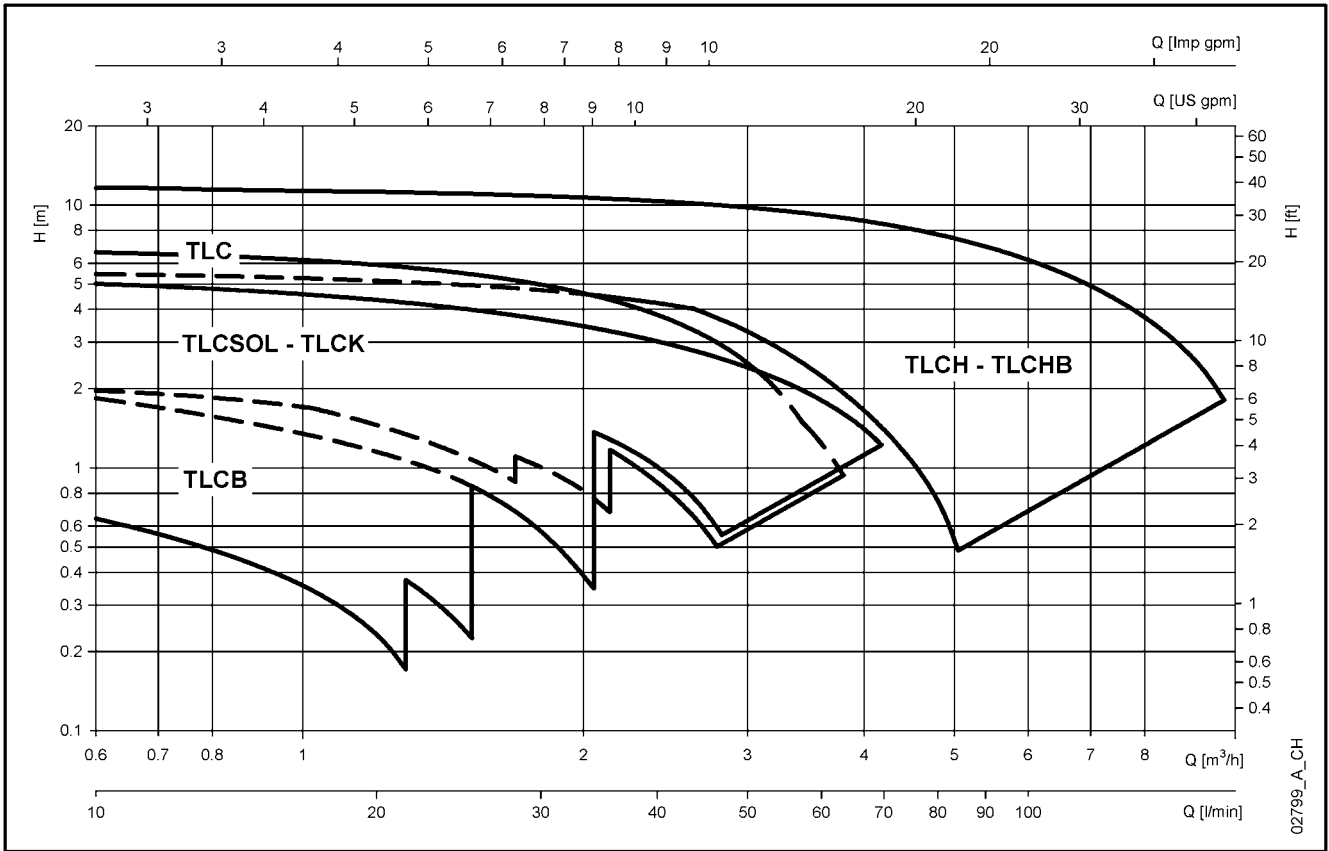
*Engineered for life*



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## TLC SERIES HYDRAULIC PERFORMANCE RANGE AT 50 Hz





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## TLC, TLCH, TLCB SERIES PRODUCT RANGE CHART

TYPE	Version	Power supply	Pump coupling	Temperature of pumped liquid			Ambient temperature	Protection class
	Single	Single-phase 230 V 50 Hz	Threaded	-25°C ÷ +110°C	+2°C ÷ +110°C	+2°C ÷ +130°C	Max 40°C	IP 44
<b>RESIDENTIAL</b>								
TLC 15-2.5	•	•	•		•		•	•
TLC 25-2.5L	•	•	•		•		•	•
TLC 32-2.5L	•	•	•		•		•	•
TLC 15-4	•	•	•		•		•	•
TLC 25-4	•	•	•		•		•	•
TLC 25-4L	•	•	•		•		•	•
TLC 32-4L	•	•	•		•		•	•
TLC 15-5	•	•	•		•		•	•
TLC 25-5	•	•	•		•		•	•
TLC 25-5L	•	•	•		•		•	•
TLC 32-5L	•	•	•		•		•	•
TLC 15-6	•	•	•		•		•	•
TLC 25-6	•	•	•		•		•	•
TLC 25-6L	•	•	•		•		•	•
TLC 32-6L	•	•	•		•		•	•
TLC 15-7	•	•	•		•		•	•
TLC 25-7L	•	•	•		•		•	•
TLC 32-7L	•	•	•		•		•	•
<b>LIGHT COMMERCIAL</b>								
TLCH 25-7L	•	•	•		•		•	•
TLCH 32-7L	•	•	•		•		•	•
TLCH 25-8L	•	•	•		•		•	•
TLCH 32-8L	•	•	•		•		•	•
TLCH 25-10L	•	•	•		•		•	•
TLCH 32-10L	•	•	•		•		•	•
TLCH 25-12L	•	•	•		•		•	•
TLCH 32-12L	•	•	•		•		•	•
<b>SANITARY</b>								
TLCB 15-1.5	•	•	•		•		•	•
TLCB 20-1.5M	•	•	•		•		•	•
TLCB 25-1.5	•	•	•		•		•	•
TLCB 15-3	•	•	•		•		•	•
TLCB 20-3M	•	•	•		•		•	•
TLCB 25-3	•	•	•		•		•	•
TLCB 15-4	•	•	•		•		•	•
TLCB 20-4M	•	•	•		•		•	•
TLCB 25-4	•	•	•		•		•	•
TLCB 25-4L	•	•	•		•		•	•
TLCB 15-6	•	•	•		•		•	•
TLCB 20-6M	•	•	•		•		•	•
TLCB 25-6L	•	•	•		•		•	•



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## TLCHB, TLCSOL, TLCK SERIES PRODUCT RANGE CHART

TYPE	Version	Power supply	Pump coupling	Temperature of pumped liquid			Ambient temperature	Protection class
	Single	Single-phase 230 V 50 Hz	Threaded	-25°C ÷ +110°C	+2°C ÷ +110°C	-10°C ÷ +130°C	Max 40°C	IP 44
<b>SANITARY LIGHT COMMERCIAL</b>								
TLCHB 20-7L	•	•	•		•		•	•
TLCHB 25-7L	•	•	•		•		•	•
TLCHB 20-8L	•	•	•		•		•	•
TLCHB 25-8L	•	•	•		•		•	•
TLCHB 20-10L	•	•	•		•		•	•
TLCHB 25-10L	•	•	•		•		•	•
TLCHB 20-12L	•	•	•		•		•	•
TLCHB 25-12L	•	•	•		•		•	•
<b>SOLAR</b>								
TLCSOL 15-4	•	•	•			•		•
TLCSOL 25-4L	•	•	•			•		•
TLCSOL 15-6	•	•	•			•		•
TLCSOL 25-6L	•	•	•			•		•
<b>COOLING</b>								
TLCK 25-4L	•	•	•	•				•
TLCK 25-6L	•	•	•	•				•

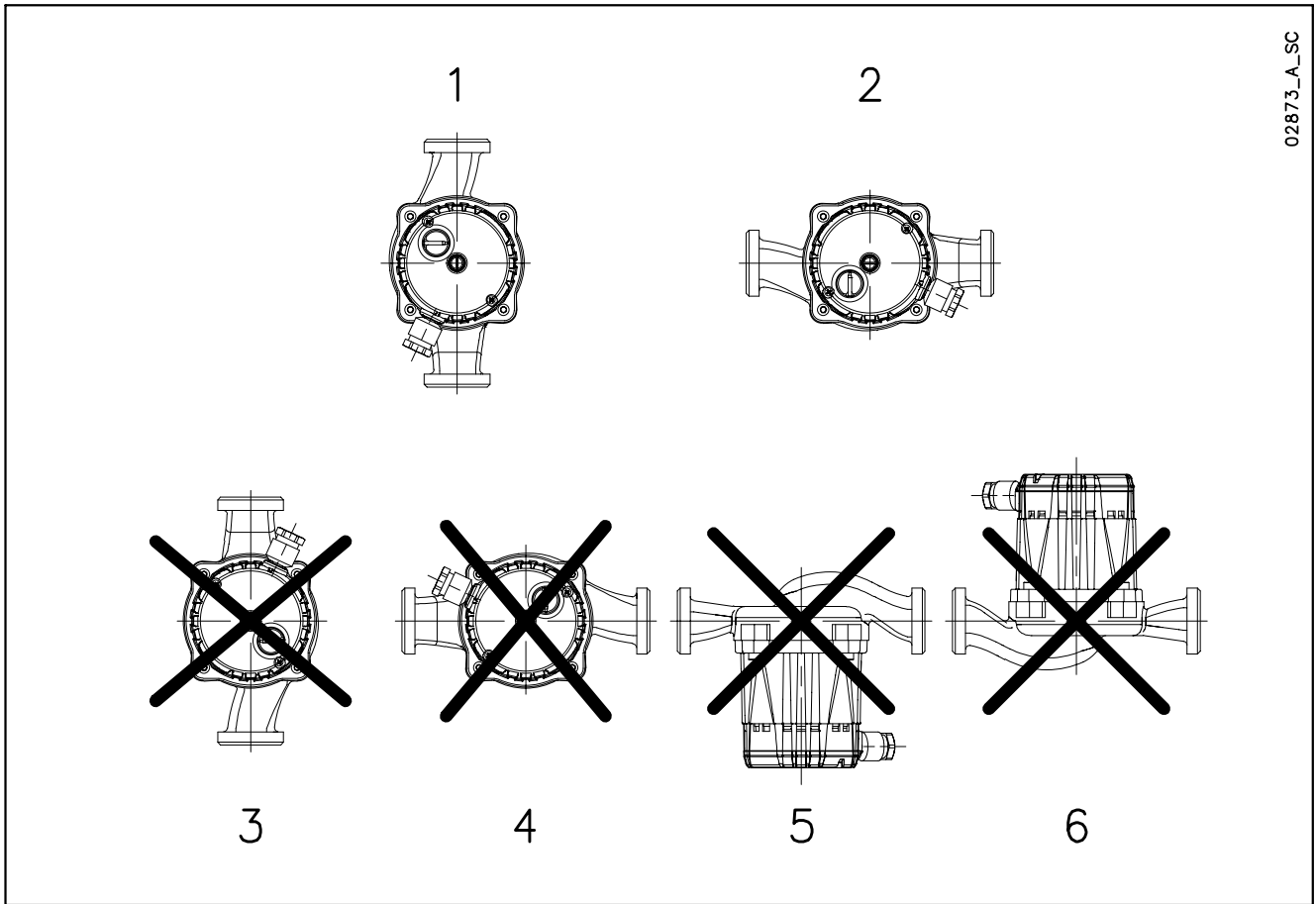
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## TLC SERIES INSTALLATION POSITIONS



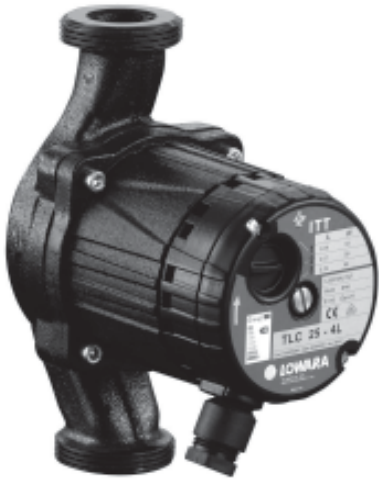
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Ref. 1, 2 = Proper position.

Ref. 3, 4, 5, 6 = Improper position.

## Circulators for residential systems

### TLC Series



### MARKET SECTORS

RESIDENTIAL.

### APPLICATIONS

- Water circulation in heating and air conditioning systems.
- Pumping of hot/cold, chemically and mechanically non-aggressive liquids.

### SPECIFICATIONS

#### PUMP

- **Flow rate:** up to 4 m<sup>3</sup>/h.
- **Head:** up to 7 m.
- **Temperature of pumped liquid:** +2°C ÷ +110°C.  
Maximum 20% glycol and water mixture.
- **Maximum operating pressure:** 10 bar (PN 10).
- **Impeller:** made of composite material.
- **Wear ring:** ceramic.

#### MOTOR

- Wet rotor type, with bearings lubricated by the pumped liquid.  
Axial and radial bearings made of ceramic.
- Single-phase 230 V 50 Hz power supply. Terminal box axially integrated in the motor.
- 2-pole, three-speed motor, with manual speed selection.
- According to EN standards 60335-1 and 2-51.
- Class H **Insulation** (180°C).
- **Protection class:** IP 44.

### CONSTRUCTION CHARACTERISTICS

- Electric circulator pumps with in-line suction and discharge ports, designed for direct installation onto piping, with 1", 1" ¼ and 1" ½ threaded connections.

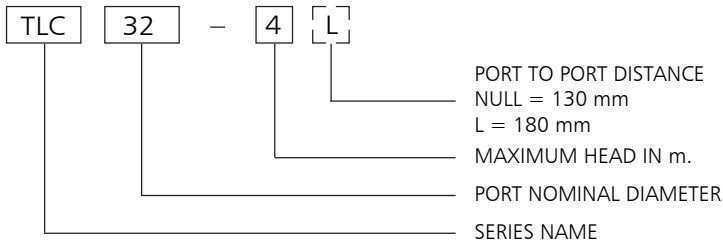
### ACCESSORIES

- Pipe unions.
- Insulation shell.

### INSTALLATION

- Suitable for installation on horizontal or vertical piping, in any position provided that motor axis is horizontal.

## TLC SERIES IDENTIFICATION CODE



EXAMPLE : TCL 32-4L

TCL series circulator, port nominal diameter = 32,  
max head = 4 m, with port to port distance of 180 mm.

## TABLE OF MATERIALS

PART	MATERIAL
Pump body	Cast iron cataphoretically coated
Impeller	Composite material
Shaft	Ceramics
Inner jacket	Stainless steel
Wear ring	Ceramics
Bearings	Ceramics
Gaskets	EPDM

tlc-2p50-en\_a\_tm

## TLC SERIES HYDRAULIC PERFORMANCE TABLE

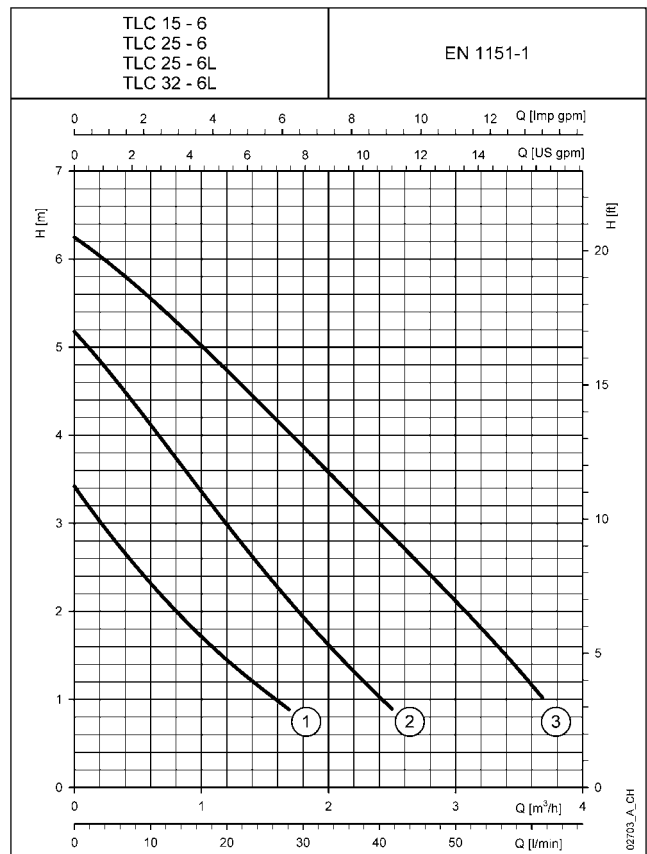
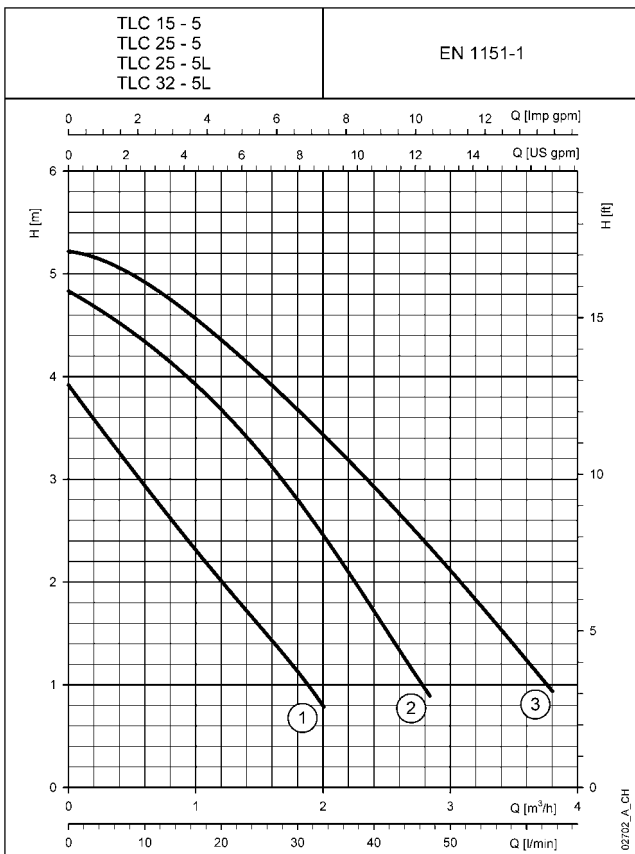
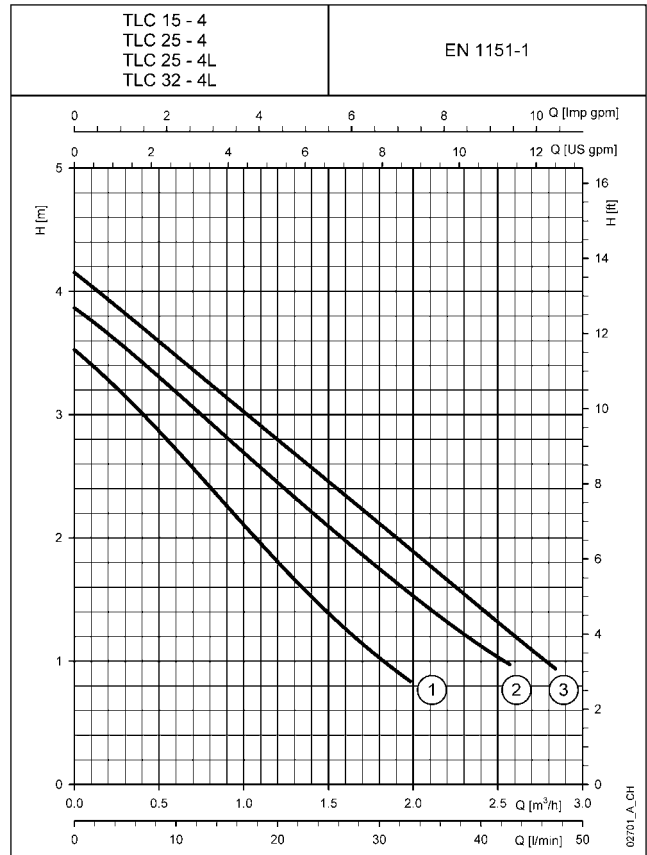
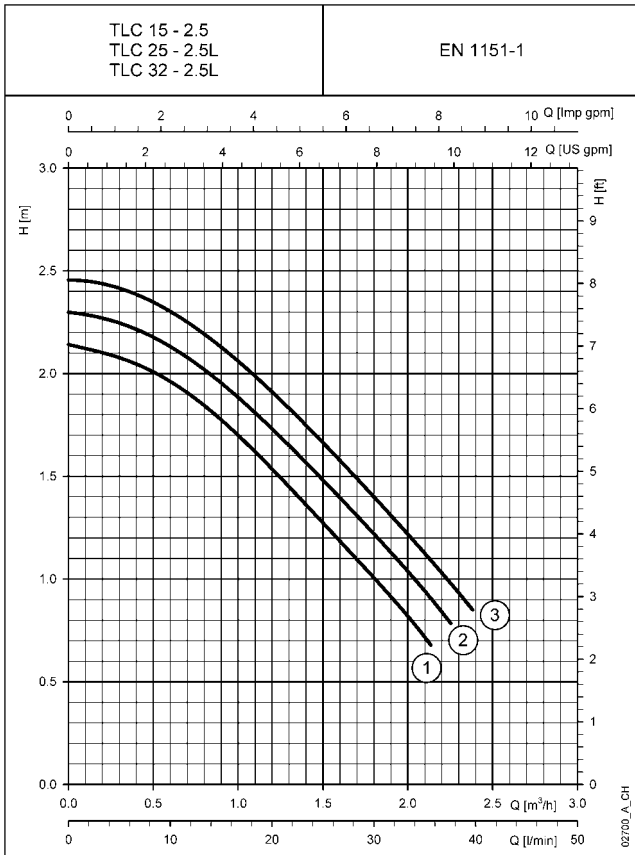
PUMP TYPE	ABSORBED POWER	NOMINAL INTENSITY	CAPACITOR		SPEED	Q = DELIVERY								
						l/min 0	10	20	28	33	40	47	53	64
						m <sup>3</sup> /h 0	0,6	1,2	1,7	2,0	2,4	2,8	3,2	3,9
<b>230V 50Hz</b>	<b>W</b>	<b>A</b>	<b>µF</b>	<b>V</b>	<b>min<sup>-1</sup></b>	<b>H = TOTAL HEAD METRES COLUMN OF WATER</b>								
TLC 15-2.5	27	0,12	1,5	400	1	2,1	2,0	1,5	1,1	0,8				
TLC 25-2.5L	32	0,14			2	2,3	2,1	1,7	1,3	1,1				
TLC 32-2.5L	35	0,15			3	2,5	2,3	1,9	1,5	1,2	0,9			
TLC 15-4	33	0,14	1,5	400	1	3,5	2,7	1,8	1,2	0,8				
TLC 25-4 (L)	39	0,17			2	3,9	3,2	2,4	1,9	1,6	1,1			
TLC 32-4L	44	0,19			3	4,2	3,5	2,8	2,2	1,9	1,5	0,9		
TLC 15-5	43	0,19	2,0	400	1	3,9	2,9	2,0	1,3	0,8				
TLC 25-5 (L)	63	0,28			2	4,8	4,3	3,7	3,0	2,5	1,8	0,9		
TLC 32-5L	77	0,34			3	5,2	4,9	4,4	3,8	3,5	3,0	2,3	1,8	
TLC 15-6	43	0,19	2,0	400	1	3,4	2,3	1,5	0,9					
TLC 25-6 (L)	65	0,28			2	5,2	4,1	3,0	2,1	1,7	1,1			
TLC 32-6L	80	0,34			3	6,2	5,6	4,7	4,0	3,6	3,0	2,4	1,8	
TLC 15-7	54	0,24	2,0	400	1	5,4	3,6	2,5	1,7	1,4	0,9	0,4		
TLC 25-7L	76	0,34			2	6,6	5,5	4,0	2,9	2,3	1,6	1,0	0,4	
TLC 32-7L	89	0,39			3	7,1	6,6	5,9	5,2	4,7	3,9	2,9	2,0	0,4

Performances according to standards EN 1151-1

tlc-2p50-en\_a\_th



## TLC SERIES SINGLE-PHASE OPERATING CHARACTERISTICS



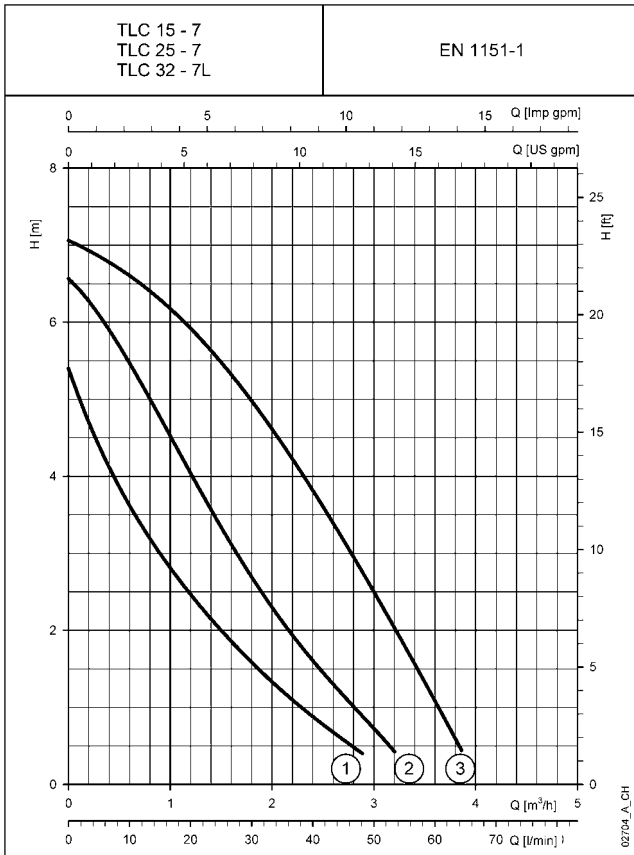
These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .



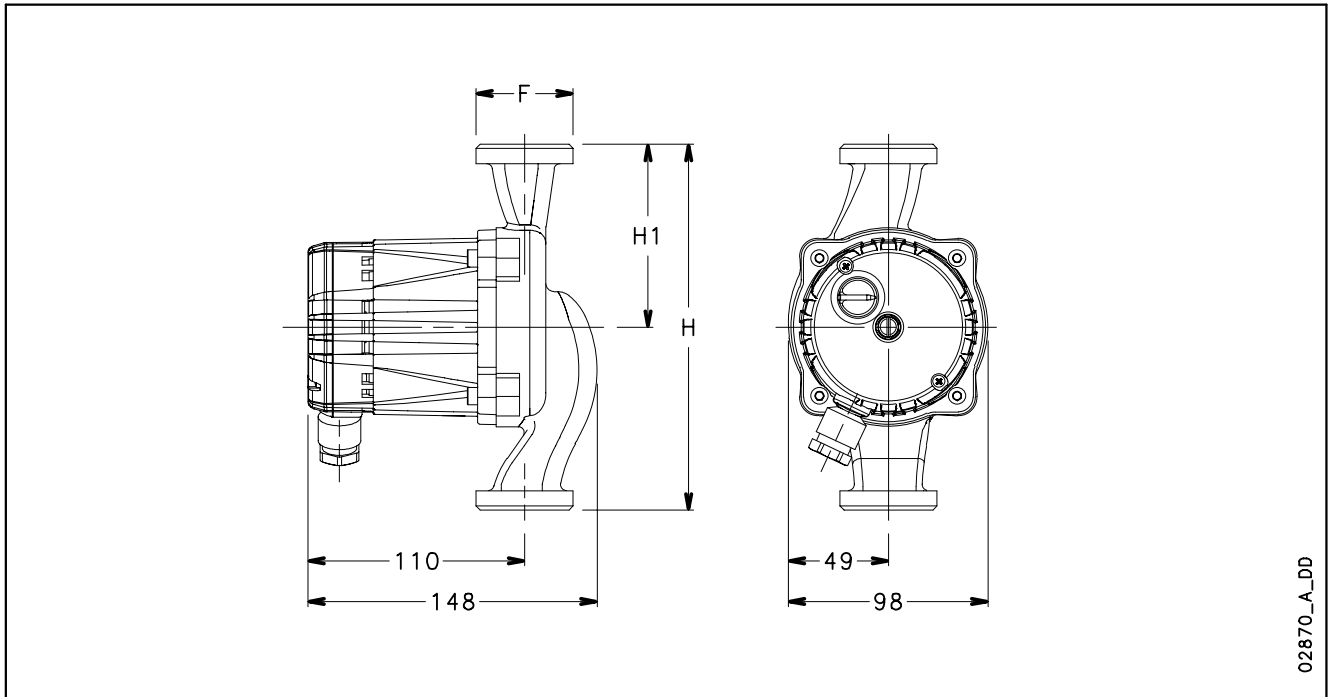
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## TLC SERIES SINGLE-PHASE OPERATING CHARACTERISTICS



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

**TLC SERIES  
DIMENSIONS AND WEIGHTS**

**DIMENSIONS AND WEIGHTS TABLE**

PUMP TYPE	DIMENSIONS (mm)			DN	WEIGHT kg
	H	H1	F		
TLC 15-2.5	130	65	R 1/2	15	2,6
TLC 25-2.5L	180	90	R 1	25	2,7
TLC 32-2.5L	180	90	R 1 1/4	32	2,8
TLC 15-4	130	65	R 1/2	15	2,6
TLC 25-4	130	65	R 1	25	2,7
TLC 25-4L	180	90	R 1	25	2,7
TLC 32-4L	180	90	R 1 1/4	32	2,8
TLC 15-5	130	65	R 1/2	15	2,6
TLC 25-5	130	65	R 1	25	2,7
TLC 25-5L	180	90	R 1	25	2,7
TLC 32-5L	180	90	R 1 1/4	32	2,8
TLC 15-6	130	65	R 1/2	15	2,6
TLC 25-6	130	65	R 1	25	2,7
TLC 25-6L	180	90	R 1	25	2,8
TLC 32-6L	180	90	R 1 1/4	32	2,8
TLC 15-7	130	65	R 1/2	15	2,6
TLC 25-7L	180	90	R 1	25	2,8
TLC 32-7L	180	90	R 1 1/4	32	2,8

tlc-2p50-en\_a\_td



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## Circulators for residential systems

### TLCH Series



### MARKET SECTORS

LIGHT COMMERCIAL.

### APPLICATIONS

- Circulation of water in heating and air conditioning high flow/high head systems.
- Pumping of hot/cold, chemically and mechanically non-aggressive liquids.

### SPECIFICATIONS

#### PUMP

- **Flow rate:** up to 12 m<sup>3</sup>/h.
- **Head:** up to 12 m.
- **Temperature of pumped liquid:** +2°C÷ +110°C.  
Maximum of 20% glycol and water mixture.
- **Maximum operating pressure:** 10 bar (PN 10).
- **Impeller:** made of composite material.
- **Wear ring:** ceramic.

#### MOTOR

- Wet rotor type, with bearings lubricated by the pumped liquid.  
Axial and radial bearings made of ceramic.
- Single-phase 230 V 50 Hz power supply.  
Terminal box axially integrated in the motor.
- 2-pole, three-speed motor, with manual speed selection.
- According to EN standards 60335-1 and 2-51.
- Class H **Insulation** (180°C).
- **Protection class:** IP 44.

### CONSTRUCTION CHARACTERISTICS

- Electric circulator pumps with in-line suction and discharge ports, designed for direct installation onto piping, with 1" 1/2 and 2" threaded connections.

### ACCESSORIES

- Pipe unions.
- Insulation shell.

### INSTALLATION

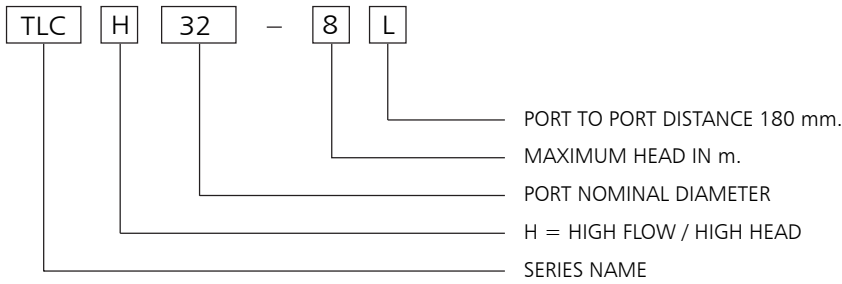
- Suitable for installation on horizontal or vertical piping, in any position, provided that motor axis is horizontal.



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## TLCH SERIES IDENTIFICATION CODE



EXAMPLE : TLCH 32-8L

TLCH series circulator, high flow/head H version, port nominal diameter = 32, max head= 8 m, with port to port distance of 180 mm.

## TABLE OF MATERIALS

PART	MATERIAL
Pump body	Cast iron cataphoretically coated
Impeller	Composite material
Shaft	Ceramics
Inner jacket	Stainless steel
Wear ring	Ceramics
Bearings	Ceramics
Gaskets	EPDM

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## TLCH SERIES HYDRAULIC PERFORMANCE TABLE

PUMP TYPE	ABSORBED POWER	NOMINAL INTENSITY	CAPACITOR		SPEED	Q = DELIVERY									
						l/min 0	20	40	60	80	100	120	140	160	
230V 50Hz	W	A	μF	V	min <sup>-1</sup>	m <sup>3</sup> /h 0	1,2	2,4	3,6	4,8	6,0	7,2	8,4	9,6	
H = TOTAL HEAD METRES COLUMN OF WATER															
TLCH 25-7L	220	1,03	8,0	400	1	5,8	5,1	4,2	3,1	1,9	1,1				
TLCH 32-7L	228	1,04			2	6,7	6,2	5,4	4,4	3,3	2,2	1,2			
	260	1,13			3	7,1	6,7	6,1	5,2	4,2	3,2	2,3	1,4		
TLCH 25-8L	260	1,23	8,0	400	1	6,6	5,9	4,7	3,1	1,8	0,8				
TLCH 32-8L	270	1,24			2	7,5	7,0	6,2	5,1	3,9	2,7	1,7			
	286	1,25			3	8,0	7,6	6,9	5,9	4,8	3,7	2,7	1,7		
TLCH 25-10L	283	1,35	8,0	400	1	8,3	7,0	5,0	2,7	1,1					
TLCH 32-10L	343	1,44			2	9,4	8,7	7,7	6,3	4,6	3,1	1,7			
	357	1,56			3	10,0	9,5	8,8	7,7	6,5	5,1	3,8	2,6	1,5	
TLCH 25-12L	285	1,36	8,0	400	1	7,8	6,5	4,5	2,2	0,7					
TLCH 32-12L	372	1,69			2	10,4	9,6	8,5	6,9	5,2	3,4	1,9			
	400	1,73			3	11,9	11,2	10,3	9,2	7,7	6,2	4,7	3,3	2,0	

Performances according to standards EN 1151-1

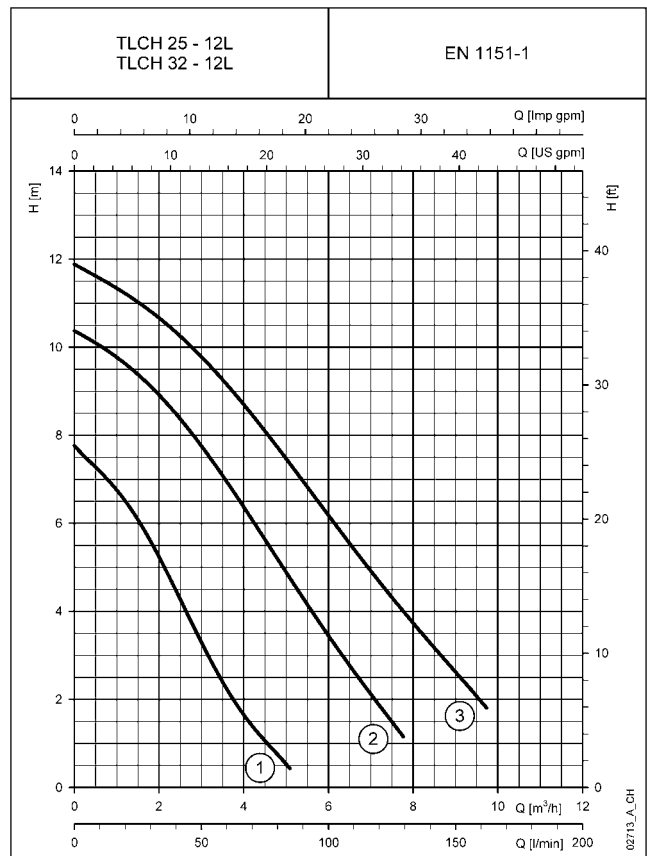
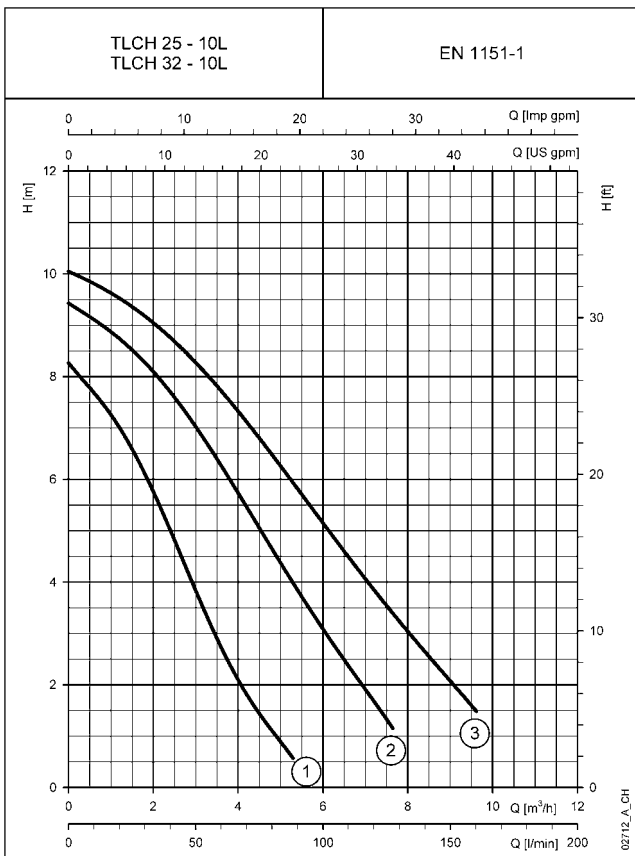
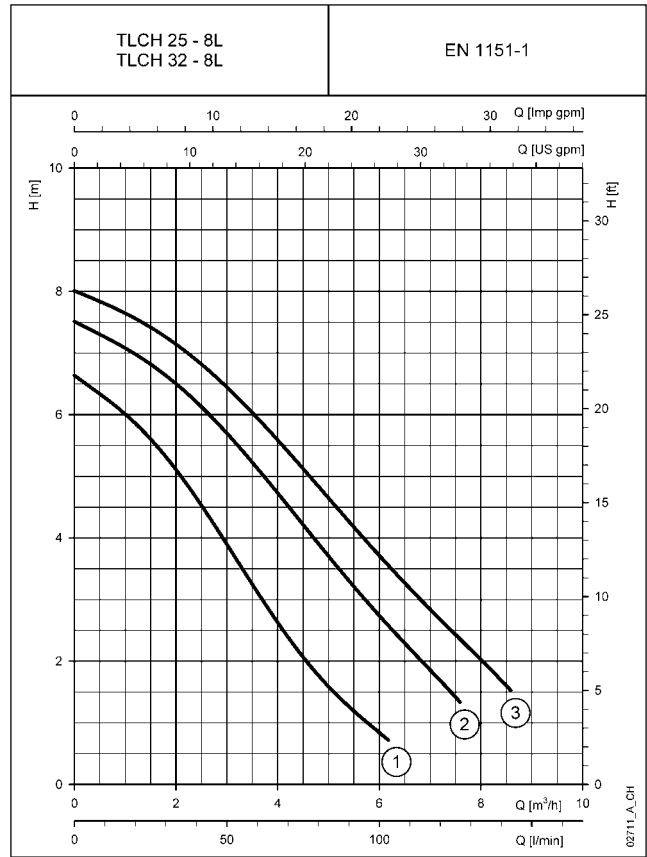
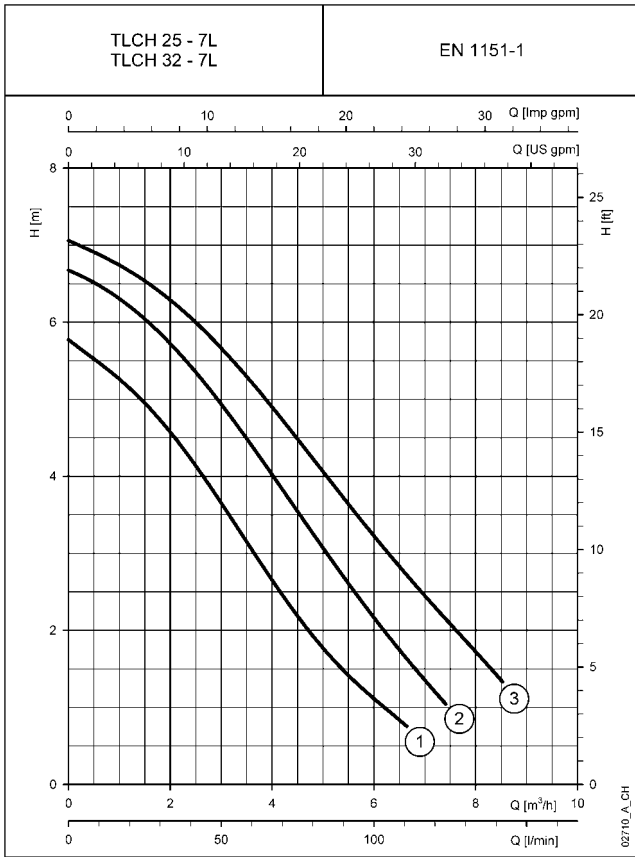
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## TLCH SERIES SINGLE-PHASE OPERATING CHARACTERISTICS



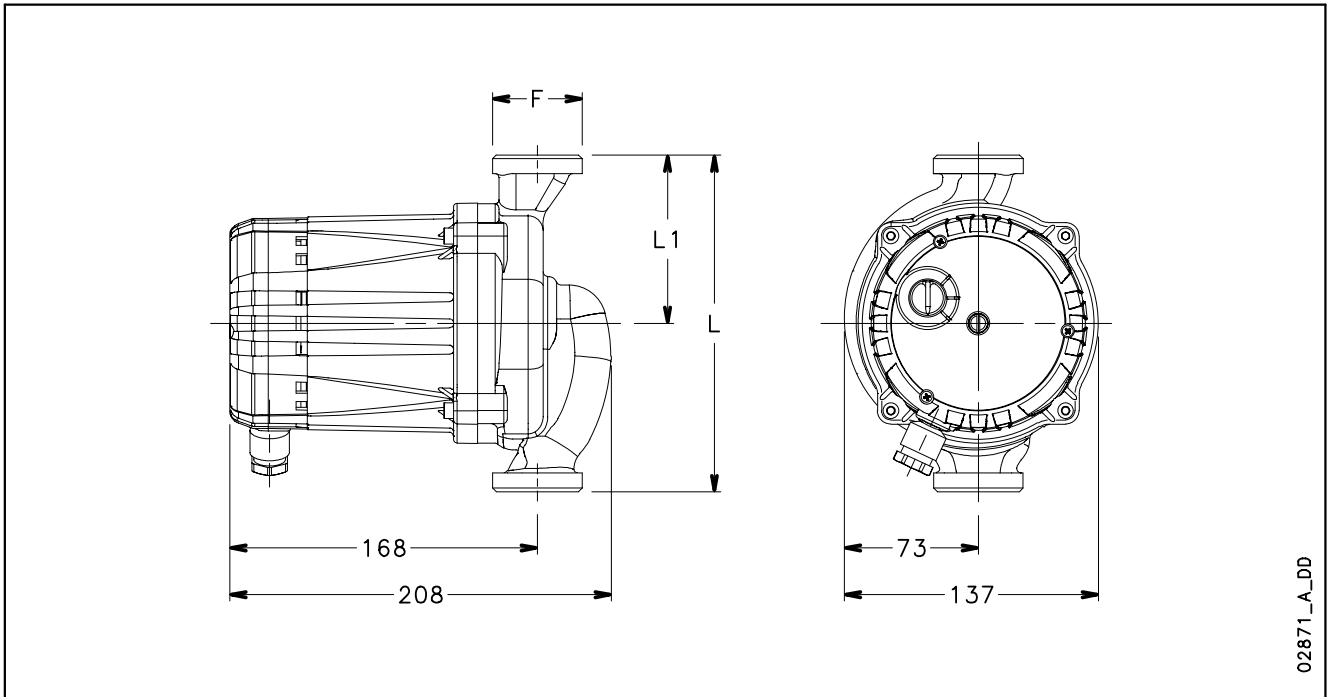
These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .



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## TLCH SERIES DIMENSIONS AND WEIGHTS



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## DIMENSIONS AND WEIGHTS TABLE

PUMP TYPE	DIMENSIONS (mm)		F	DN	WEIGHT kg
	H	H1			
TLCH 25-7L	180	90	R 1	25	6,5
TLCH 32-7L	180	90	R 1¼	32	6,6
TLCH 25-8L	180	90	R 1	25	6,5
TLCH 32-8L	180	90	R 1¼	32	6,6
TLCH 25-10L	180	90	R 1	25	6,5
TLCH 32-10L	180	90	R 1¼	32	6,6
TLCH 25-12L	180	90	R 1	25	6,5
TLCH 32-12L	180	90	R 1¼	32	6,6

tlch-2p50-en\_a\_td



**Sanitary  
Circulators**
**MARKET SECTORS**

RESIDENTIAL AND CIVIL.

**APPLICATIONS**

- Circulation of sanitary hot water.

**TLCB Series**

**SPECIFICATIONS**
**PUMP**

- **Flow rate:** up to 5 m<sup>3</sup>/h.
- **Head:** up to 6 m.
- **Temperature of pumped liquid:** +2°C ÷ +110°C.
- **Maximum operating pressure:** 10 bar (PN 10).
- **Impeller:** made of composite material.
- **Wear ring:** ceramic.

**MOTOR**

- Wet rotor type, with bearings lubricated by the pumped liquid. Axial and radial bearings made of ceramic.
- Single-phase 230 V 50 Hz power supply. Terminal box axially integrated in the motor.
- 2-pole, three-speed motor, with manual speed selection.
- According to EN standards 60335-1 and 2-51.
- Class H **Insulation** (180°C).
- **Protection class:** IP 44.

**CONSTRUCTION CHARACTERISTICS**

- Electric circulator pumps for sanitary hot water circulation, at a maximum temperature of 65°C, maximum hardness of 14° dH and maximum viscosity of 10 mm<sup>2</sup>/S.
- Bronze pump body designed for direct installation onto copper piping, with 1", 1" ¼ and 1" ½ threaded connections.

**ACCESSORIES**

- Pipe unions.
- Insulation shell.

**INSTALLATION**

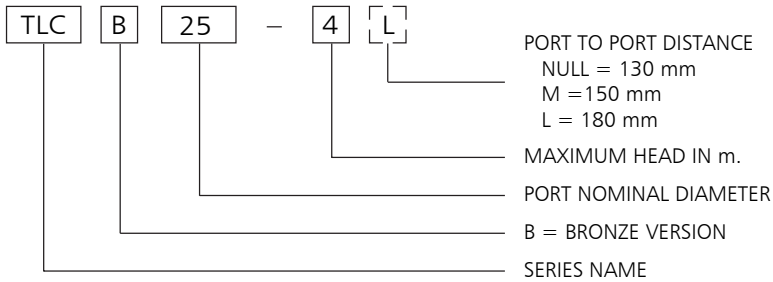
- Suitable for installation on horizontal or vertical piping, in any position provided that motor axis is horizontal.



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## TLCB SERIES IDENTIFICATION CODE



EXAMPLE : TLCB 25-4L

TLC series circulator, bronze B version, port nominal diameter = 25, max head = 4 m, with port to port distance of 180 mm.

## TABLE OF MATERIALS

PART	MATERIAL
Pump body	Bronze
Impeller	Composite material
Shaft	Ceramics
Inner jacket	Stainless steel
Wear ring	Ceramics
Bearings	Ceramics
Gaskets	EPDM

t1cb-2p50-en\_a\_tm

## TLCB SERIES HYDRAULIC PERFORMANCE TABLE

PUMP TYPE	ABSORBED POWER	NOMINAL INTENSITY	CAPACITOR		SPEED	Q = DELIVERY									
						l/min 0	10	20	25	30	40	50	60	70	
230V 50Hz	W	A	μF	V	min <sup>-1</sup>	m <sup>3</sup> /h 0	0,6	1,2	1,5	1,8	2,4	3,0	3,6	4,2	
H = TOTAL HEAD METRES COLUMN OF WATER															
TLCB 15-1.5	28	0,16	2,0	400	1	1,0	0,8	0,4	0,2						
TLCB 20-1.5M	43	0,24			2	1,2	1,0	0,6	0,4						
TLCB 25-1.5	58	0,28			3	1,4	1,2	0,8	0,6	0,4					
TLCB 15-3	33	0,17	2,0	400	1	1,3	0,6	0,2							
TLCB 20-3M	48	0,25			2	2,5	1,7	1,0	0,8	0,5					
TLCB 25-3	63	0,30			3	3,0	2,7	2,2	2,0	1,7	1,1				
TLCB 15-4	40	0,19	2,0	400	1	3,0	2,6	2,1	1,9	1,6	1,0				
TLCB 20-4M	59	0,28			2	3,5	3,3	2,9	2,7	2,4	1,8	1,3			
TLCB 25-4 (L)	70	0,33			3	4,0	3,8	3,5	3,3	3,0	2,5	2,0	1,3		
TLCB 15-6	56	0,27	3,0	400	1	3,1	1,9	1,2	0,9	0,6					
TLCB 20-6M	83	0,37			2	4,7	3,6	2,7	2,3	1,9	1,2	0,7			
TLCB 25-6L	100	0,44			3	5,6	5,0	4,4	4,0	3,7	3,1	2,4	1,8	1,2	

Performances according to standards EN 1151-1

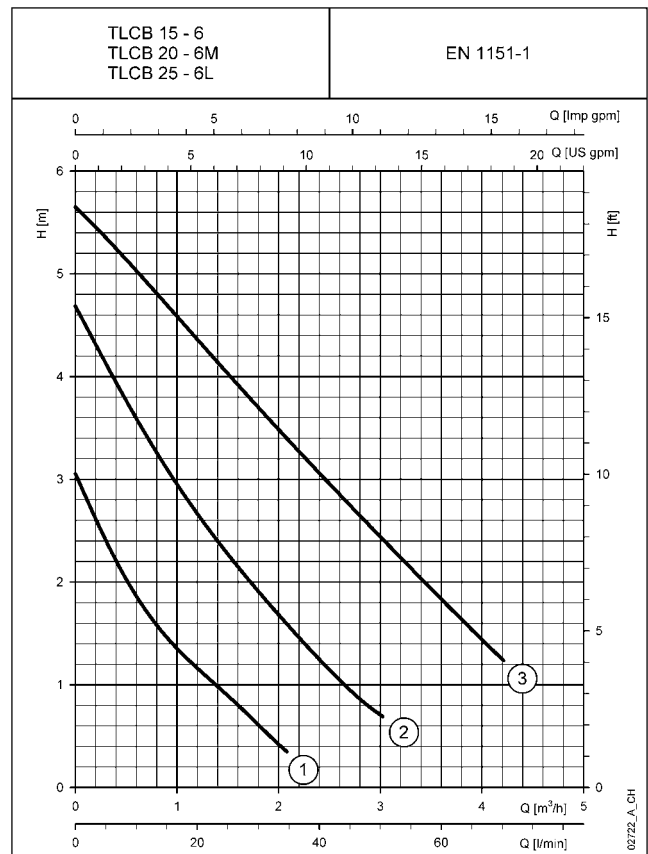
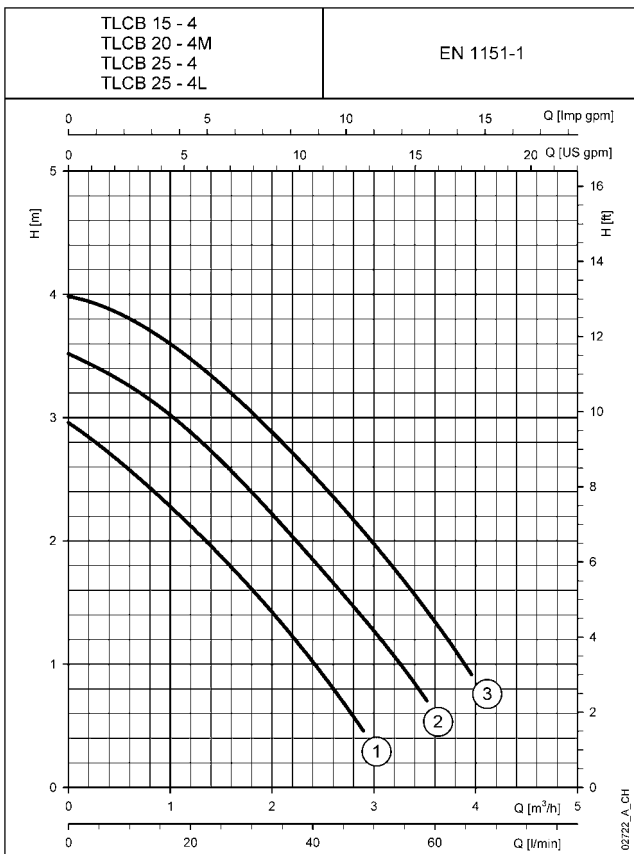
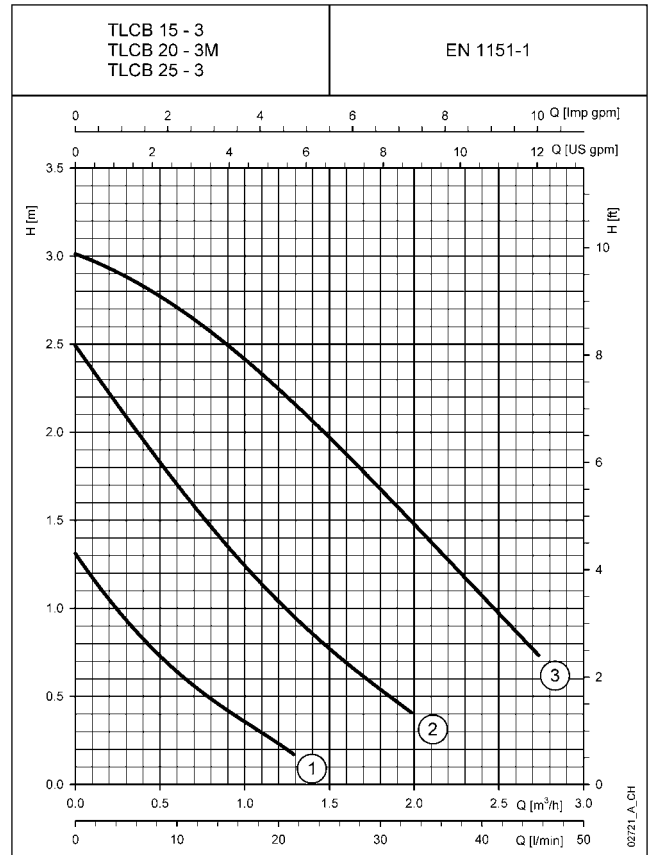
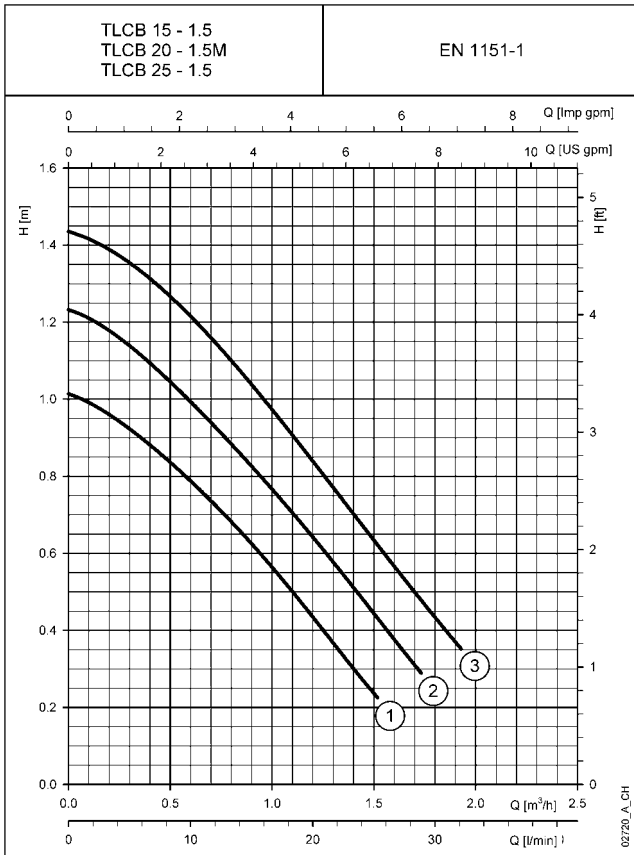
t1cb-2p50-en\_a\_th



# ITT

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## TLCB SERIES SINGLE-PHASE OPERATING CHARACTERISTICS



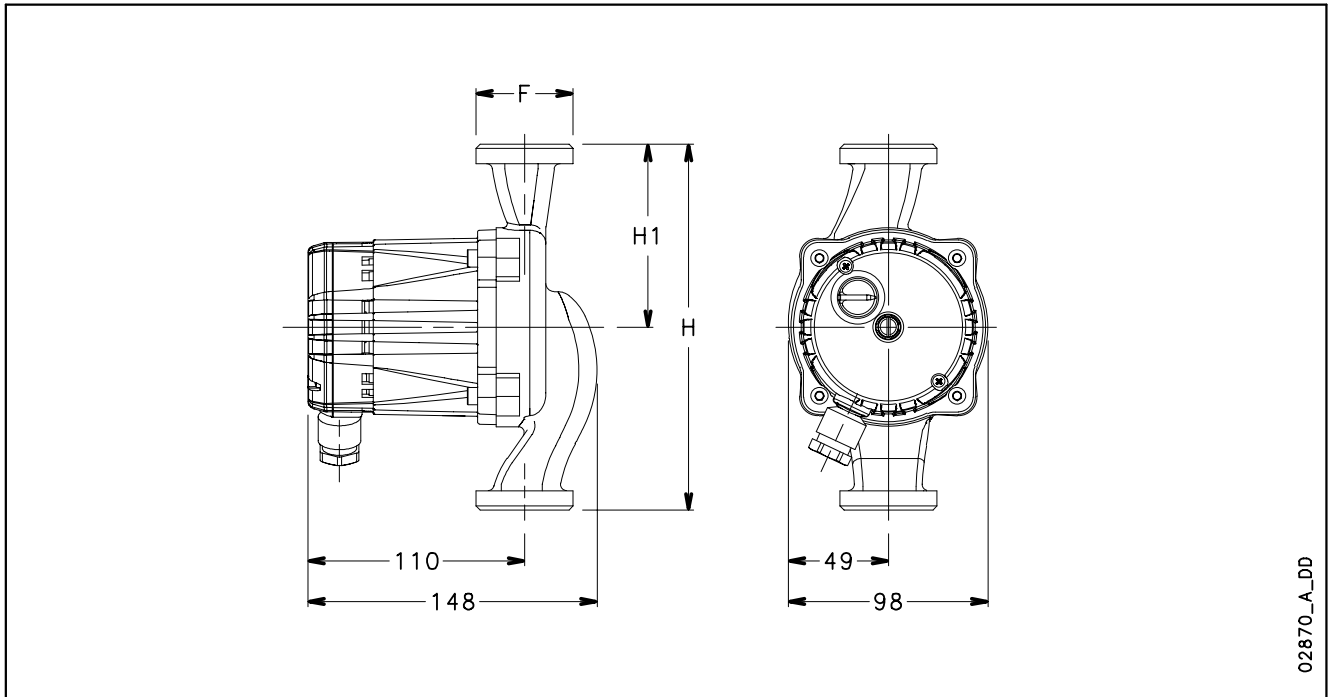
These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .



**ITT**

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**TLCB SERIES  
DIMENSIONS AND WEIGHTS**



**DIMENSIONS AND WEIGHTS TABLE**

PUMP TYPE	DIMENSIONS (mm)			DN	WEIGHT kg
	H	H1	F		
TLCB 15-1.5	130	65	R 1/2	15	2,9
TLCB 20-1.5M	150	75	R 3/4	20	3
TLCB 25-1.5	130	65	R 1	25	3
TLCB 15-3	130	65	R 1/2	15	2,9
TLCB 20-3M	150	75	R 3/4	20	3
TLCB 25-3	130	65	R 1	25	3
TLCB 15-4	130	65	R 1/2	15	2,9
TLCB 20-4M	150	75	R 3/4	20	3
TLCB 25-4	130	65	R 1	25	3
TLCB 25-4L	180	90	R 1	25	3,1
TLCB 15-6	130	65	R 1/2	15	2,9
TLCB 20-6M	150	75	R 3/4	20	3
TLCB 25-6L	180	90	R 1	25	3,1

tltcb-2p50-en\_a\_td

## Sanitary Circulators

### MARKET SECTORS

SANITARY LIGHT COMMERCIAL.

### APPLICATIONS

- Circulation of sanitary hot water in high flow/high head installations.

## TLCHB Series



### SPECIFICATIONS

#### PUMP

- **Flow rate:** up to 12 m<sup>3</sup>/h.
- **Head:** up to 12 m.
- **Temperature of pumped liquid:** +2°C ÷ +110°C.
- **Maximum operating pressure:** 10 bar (PN 10).
- **Impeller:** made of composite material.
- **Wear ring:** ceramic.

#### MOTOR

- Wet rotor type, with bearings lubricated by the pumped liquid. Axial and radial bearings made of ceramic.
- Single-phase 230 V 50 Hz power supply. Terminal box axially integrated in the motor.
- 2-pole, three-speed motor, with manual speed selection.
- According to EN standards 60335-1 and 2-51.
- Class H **Insulation** (180°C).
- **Protection class:** IP 44.

### CONSTRUCTION CHARACTERISTICS

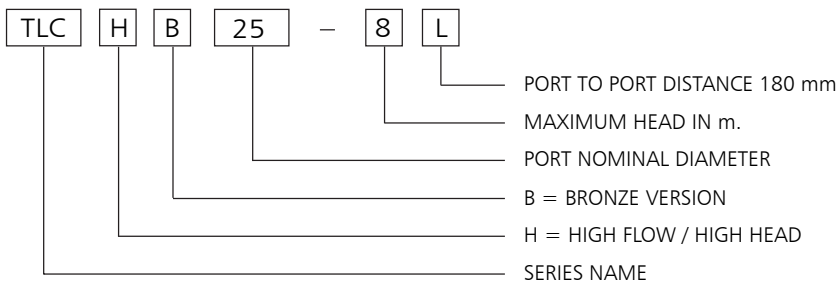
- Electric circulator pumps for sanitary hot water circulation, at a maximum temperature of 65°C, maximum hardness of 14° dH.
- Bronze pump body designed for direct installation onto copper piping, with 1" ¼ and 1" ½ threaded connections.

### ACCESSORIES

- Pipe unions.
- Insulation shell.

### INSTALLATION

- Suitable for installation on horizontal or vertical piping, in any position provided that motor axis is horizontal.

**TLCHB SERIES  
IDENTIFICATION CODE**


EXAMPLE : TLCHB 25-8L

TLC series circulator, high flow/head H version, bronze B version, port nominal diameter = 25, max head= 8 m, with port to port distance of 180 mm.

**TABLE OF MATERIALS**

PART	MATERIAL
Pump body	Bronze
Impeller	Composite material
Shaft	Ceramics
Inner jacket	Stainless steel
Wear ring	Ceramics
Bearings	Ceramics
Gaskets	EPDM

tlchb-2p50-en\_a\_tm

**TLCHB SERIES  
HYDRAULIC PERFORMANCE TABLE**

PUMP TYPE	ABSORBED POWER	NOMINAL INTENSITY	CAPACITOR		SPEED	Q = DELIVERY								
						l/min 0	20	40	60	80	100	120	140	160
						m <sup>3</sup> /h 0	1,2	2,4	3,6	4,8	6,0	7,2	8,4	9,6
230V 50Hz	W	A	μF	V	min <sup>-1</sup>	H = TOTAL HEAD METRES COLUMN OF WATER								
TLCHB 20-7L	220	1,03	8,0	400	1	5,8	5,1	4,2	3,1	1,9	1,1			
TLCHB 25-7L	228	1,04			2	6,7	6,2	5,4	4,4	3,3	2,2	1,2		
	260	1,13			3	7,1	6,7	6,1	5,2	4,2	3,2	2,3	1,4	
TLCHB 20-8L	260	1,23	8,0	400	1	6,6	5,9	4,7	3,1	1,8	0,8			
TLCHB 25-8L	270	1,24			2	7,5	7,0	6,2	5,1	3,9	2,7	1,7		
	286	1,25			3	8,0	7,6	6,9	5,9	4,8	3,7	2,7	1,7	
TLCHB 20-10L	283	1,35	8,0	400	1	8,3	7,0	5,0	2,7	1,1				
TLCHB 25-10L	343	1,44			2	9,4	8,7	7,7	6,3	4,6	3,1	1,7		
	357	1,56			3	10,0	9,5	8,8	7,7	6,5	5,1	3,8	2,6	1,5
TLCHB 20-12L	285	1,36	8,0	400	1	7,8	6,5	4,5	2,2	0,7				
TLCHB 25-12L	372	1,69			2	10,4	9,6	8,5	6,9	5,2	3,4	1,9		
	400	1,73			3	11,9	11,2	10,3	9,2	7,7	6,2	4,7	3,3	2,0

Performances according to standards EN 1151-1

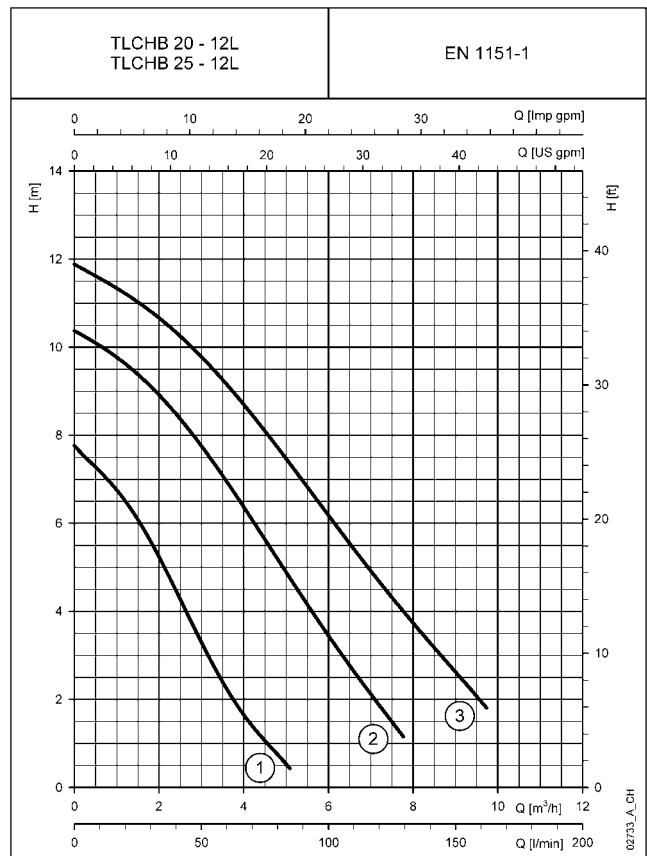
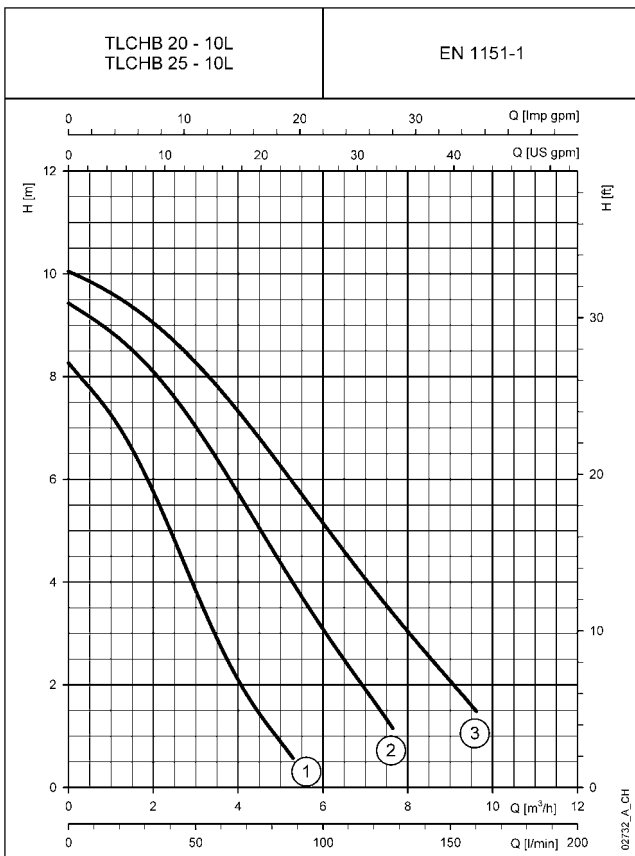
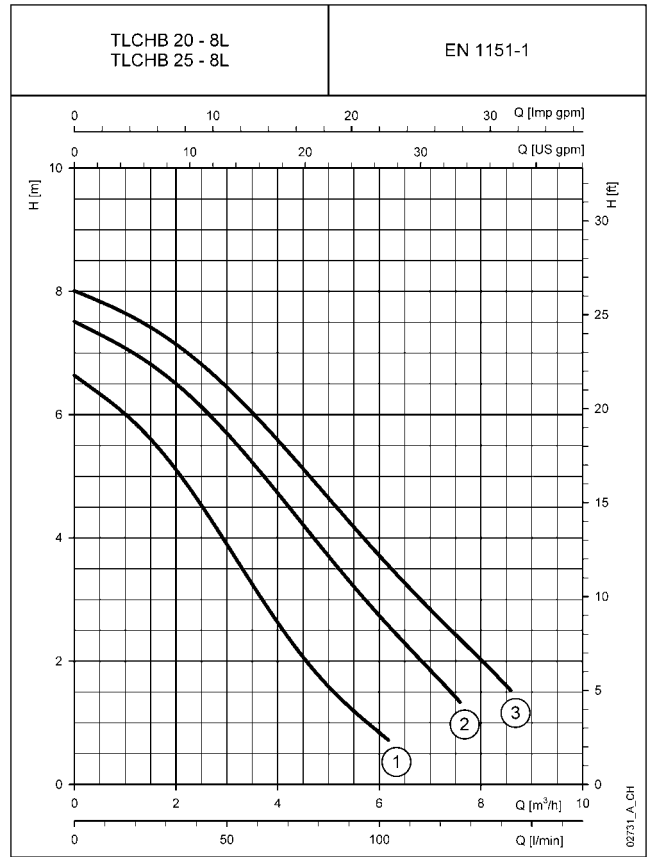
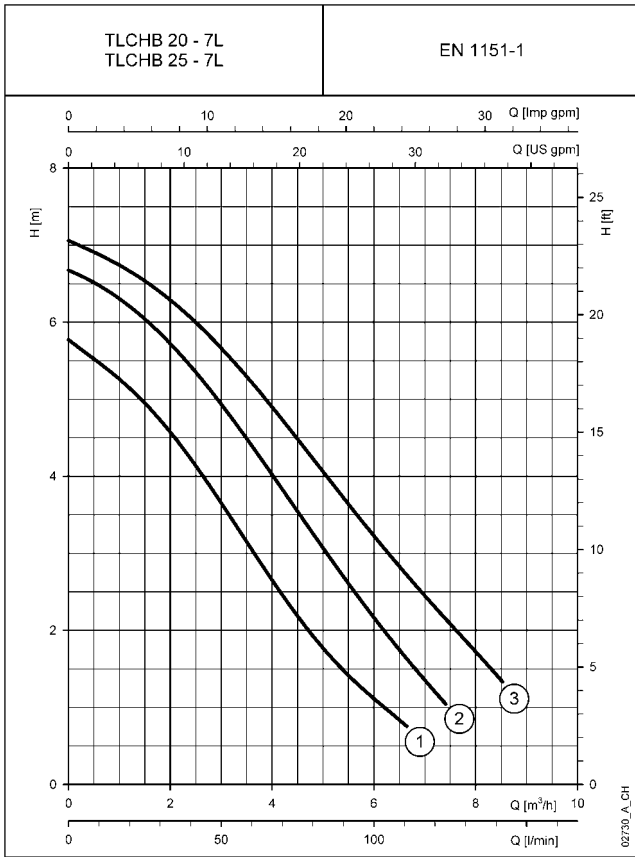
tlchb-2p50-en\_a\_th



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## TLCHB SERIES SINGLE-PHASE OPERATING CHARACTERISTICS



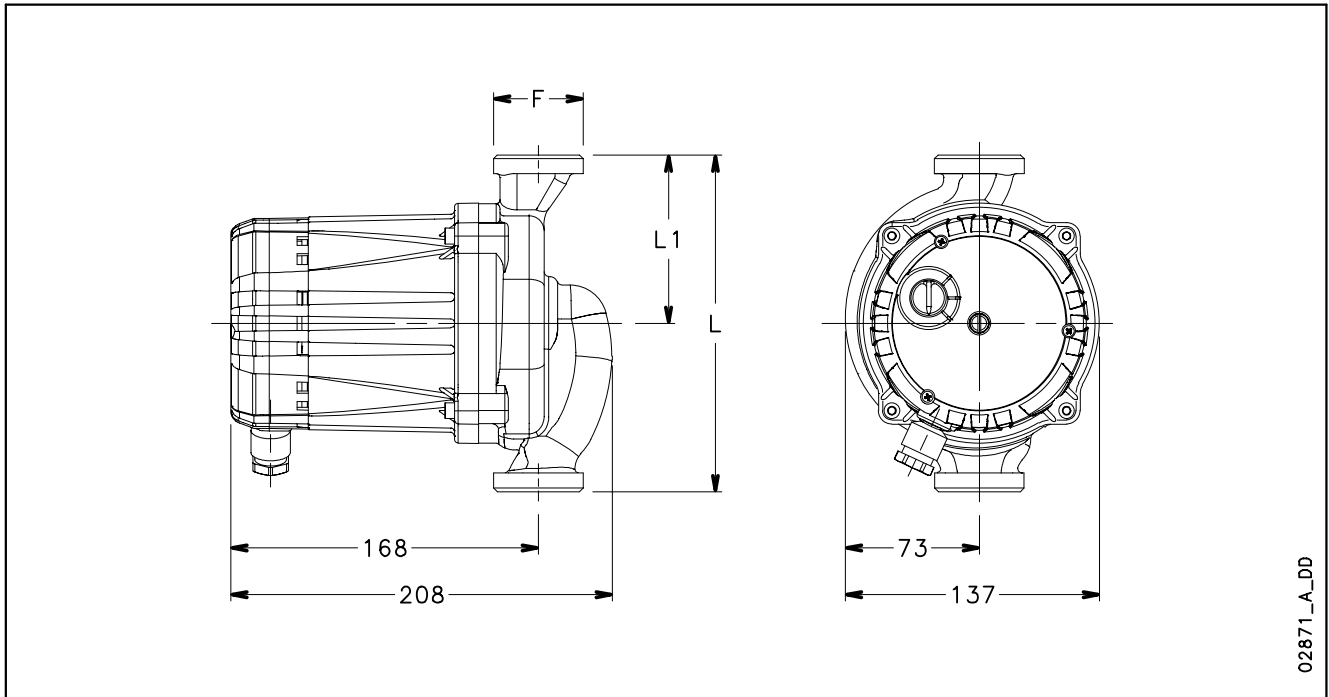
These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .



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## TLCHB SERIES DIMENSIONS AND WEIGHTS



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## DIMENSIONS AND WEIGHTS TABLE

PUMP TYPE	DIMENSIONS (mm)		F	DN	WEIGHT
	H	H1			kg
TLCHB 20-7L	180	90	R ¾	20	6,7
TLCHB 25-7L	180	90	R 1	25	6,7
TLCHB 20-8L	180	90	R ¾	20	6,7
TLCHB 25-8L	180	90	R 1	25	6,7
TLCHB 20-10L	180	90	R ¾	20	6,7
TLCHB 25-10L	180	90	R 1	25	6,7
TLCHB 20-12L	180	90	R ¾	20	6,7
TLCHB 25-12L	180	90	R 1	25	6,7

tichb-2p50-en\_a\_td



**Solar  
Circulators**
**MARKET SECTORS**

RESIDENTIAL, LIGHT COMMERCIAL.

**APPLICATIONS**

- Circulation of hot water in solar systems.

**TLCSOL Series**

**SPECIFICATIONS**
**PUMP**

- **Flow rate:** up to 5,5 m<sup>3</sup>/h.
- **Head:** up to 6 m.
- **Temperature of pumped liquid:** -10°C ÷ +110°C (+130°C can be reached for max 2h), maximum of 50% glycol and water mixture.
- **Maximum operating pressure:** 10 bar (PN 10).
- **Impeller:** made of composite material.
- **Wear ring:** ceramic.

**MOTOR**

- Wet rotor type, with bearings lubricated by the pumped liquid. Axial and radial bearings made of ceramic.
- Single-phase 230 V 50 Hz power supply. Terminal box axially integrated in the motor.
- 2-pole, three-speed motor, with manual speed selection.
- According to EN standards 60335-1 and 2-51.
- Class H **Insulation** (180°C).
- **Protection class:** IP 44.

**CONSTRUCTION CHARACTERISTICS**

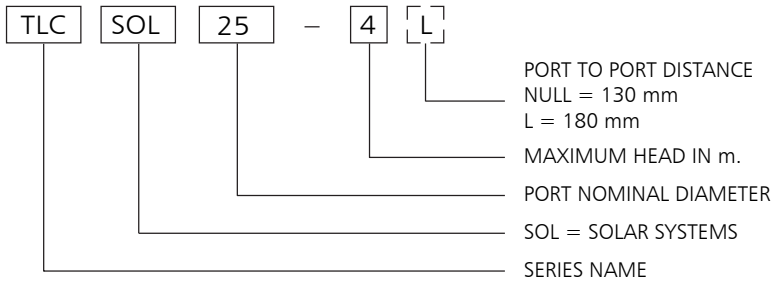
- Electric circulator pumps with in-line suction and discharge ports, designed for direct installation onto piping, with 1" and 1" ½ threaded connections.
- Resin-cast stator to avoid water condensation inside the motor.

**ACCESSORIES**

- Pipe unions.
- Insulation shell.

**INSTALLATION**

- Suitable for installation on horizontal or vertical piping, in any position provided that motor axis is horizontal.

**TLCSOL SERIES  
IDENTIFICATION CODE**


EXAMPLE : TLCSOL 25-4L

 TLC series circulator, for Solar systems, port nominal diameter = 25,  
 max head = 4 m, with port to port distance of 180 mm.

**TABLE OF MATERIALS**

PART	MATERIAL
Pump body	Cast iron cataphoretically coated
Impeller	Composite material
Shaft	Ceramics
Inner jacket	Stainless steel
Wear ring	Ceramics
Bearings	Ceramics
Gaskets	EPDM

tlcsol-2p50-en\_a\_tm

**TLCSOL SERIES  
HYDRAULIC PERFORMANCE TABLE**

PUMP TYPE	ABSORBED POWER	NOMINAL INTENSITY	CAPACITOR		SPEED	Q = DELIVERY								
						l/min 0	10	20	25	30	40	50	60	70
						m <sup>3</sup> /h 0	0,6	1,2	1,5	1,8	2,4	3,0	3,6	4,2
230V 50Hz	W	A	μF	V	min <sup>-1</sup>	H = TOTAL HEAD METRES COLUMN OF WATER								
TLCSOL 15-4	40	0,19	2,0	400	1	2,9	2,6	2,1	1,9	1,6	1,0			
TLCSOL 25-4L	59	0,28			2	3,5	3,2	2,9	2,6	2,4	1,8	1,2		
	70	0,33			3	4,0	3,8	3,4	3,3	3,0	2,5	2,0	1,3	
TLCSOL 15-6	56	0,27	3,0	400	1	3,0	1,8	1,2	0,9	0,6				
TLCSOL 25-6L	83	0,37			2	4,7	3,6	2,7	2,3	1,9	1,2	0,7		
	100	0,44			3	5,7	5,0	4,3	4,0	3,7	3,0	2,4	1,8	1,2

Performances according to standards EN 1151-1

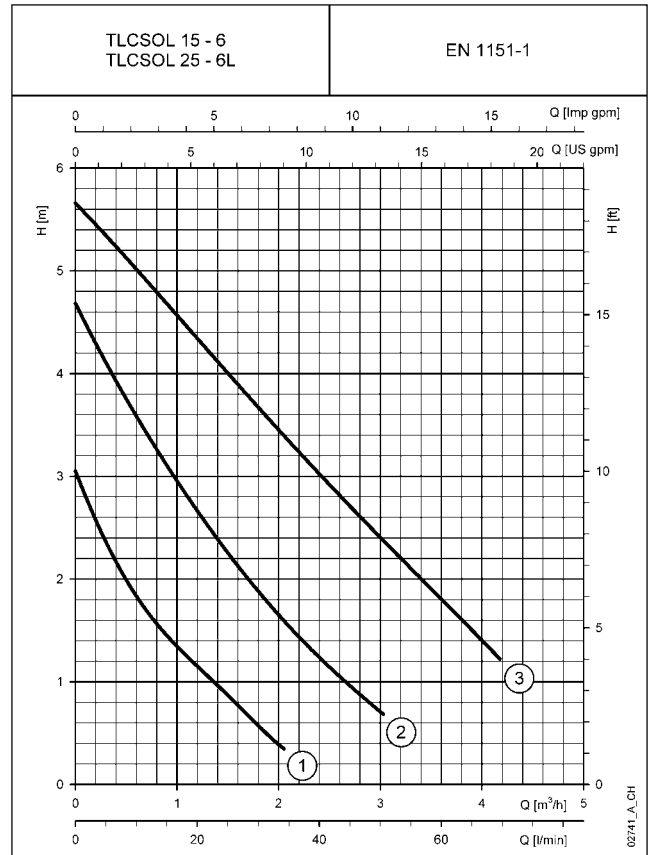
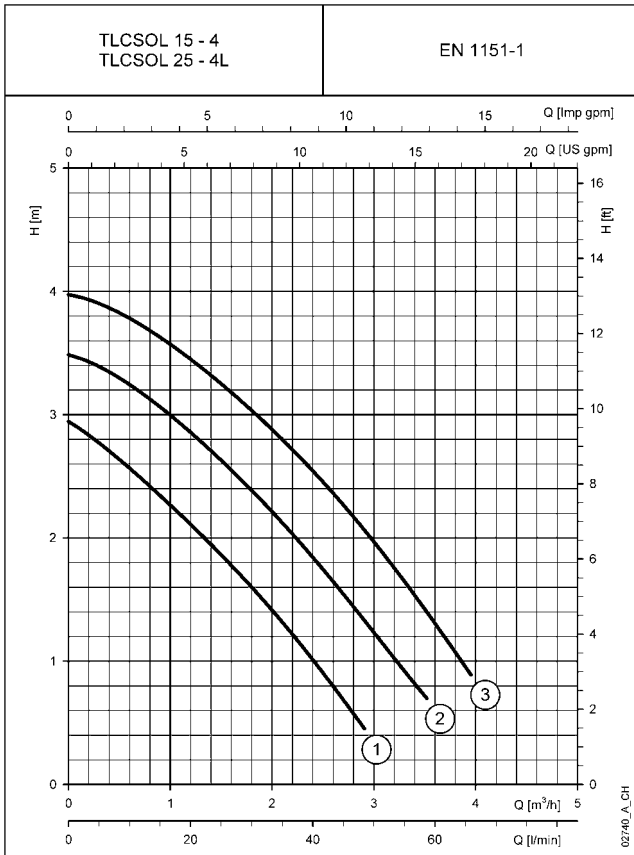
tlcsol-2p50-en\_a\_th



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## TLCSOL SERIES SINGLE-PHASE OPERATING CHARACTERISTICS



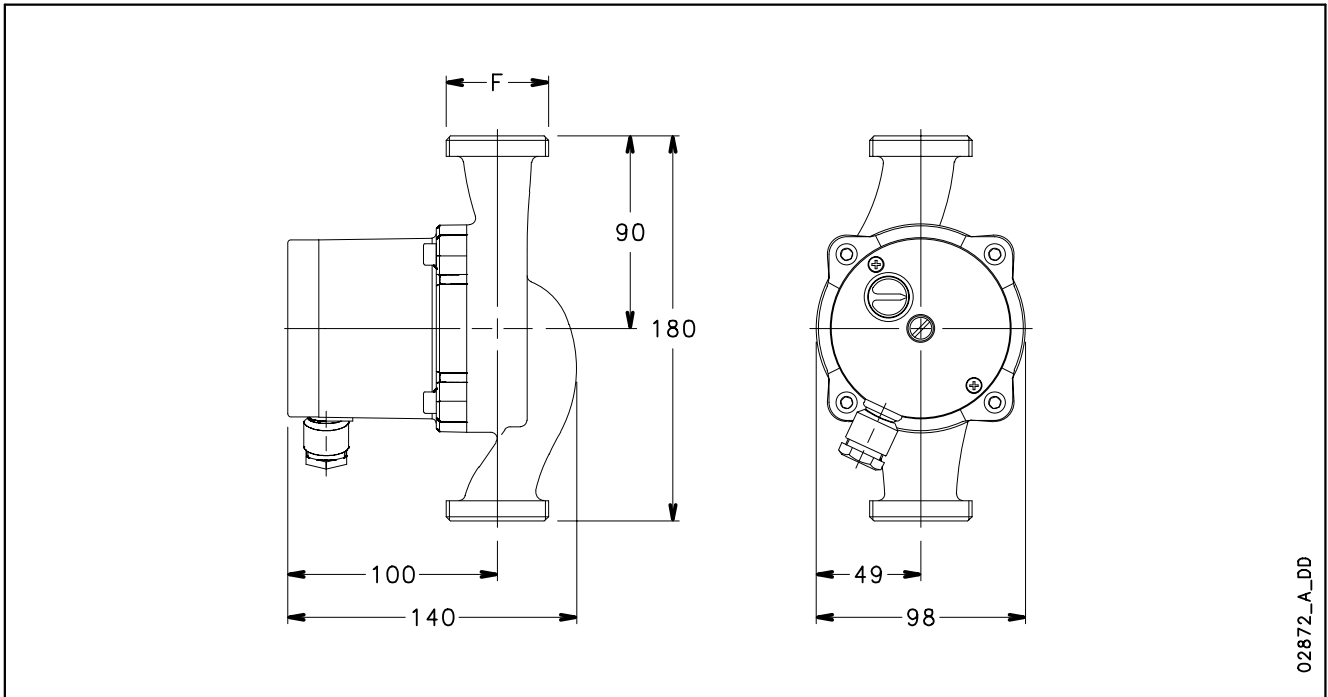
These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .



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**TLCSOL SERIES  
DIMENSIONS AND WEIGHTS**



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**DIMENSIONS AND WEIGHTS TABLE**

PUMP TYPE	DIMENSIONS (mm)		F	DN	WEIGHT kg
	H	H1			
TLCSOL 15-4	130	65	R ½	15	3
TLCSOL 25-4L	180	90	R 1	25	3
TLCSOL 15-6	130	65	R ½	15	3
TLCSOL 25-6L	180	90	R 1	25	3

tlcsol-2p50-en\_a\_td

## Refrigeration Air condition Circulators

### MARKET SECTORS

RESIDENTIAL, LIGHT COMMERCIAL.

### APPLICATIONS

- Circulation of water in air-conditioning and refrigeration systems and geothermal systems.

## TLCK Series



### SPECIFICATIONS

#### PUMP

- **Flow rate:** up to 5,5 m<sup>3</sup>/h.
- **Head:** up to 6 m.
- **Temperature of pumped liquid:** -25°C ÷ +110°C.  
Maximum of 50% glycol and water mixture.
- **Maximum operating pressure:** 10 bar (PN 10).
- **Impeller:** made of composite material.
- **Wear ring:** ceramic.

#### MOTOR

- Wet rotor type, with bearings lubricated by the pumped liquid.  
Axial and radial bearings made of ceramic.
- Single-phase 230 V 50 Hz power supply.  
Terminal box axially integrated in the motor.
- 2-pole, three-speed motor, with manual speed selection.
- According to EN standards 60335-1 and 2-51.
- Class H **Insulation** (180°C).
- **Protection class:** IP 44.

### CONSTRUCTION CHARACTERISTICS

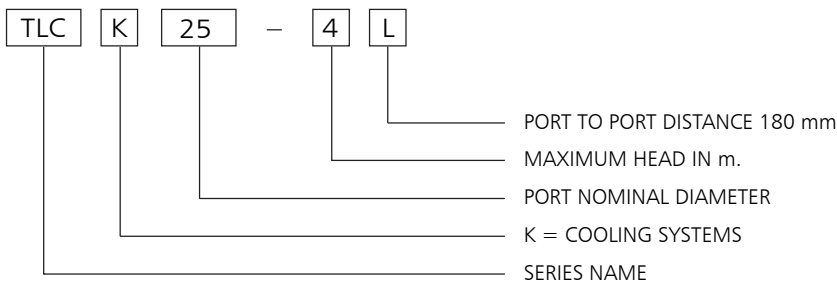
- Electric circulator pumps with in-line suction and discharge ports, designed for direct installation onto piping, with 1" and 1" ½ threaded connections.
- Resin-cast stator to avoid water condensation inside the motor.

### ACCESSORIES

- Pipe unions.
- Insulation shell.

### INSTALLATION

- Suitable for installation on horizontal or vertical piping, in any position provided that motor axis is horizontal.

**TLCK SERIES  
IDENTIFICATION CODE**


EXAMPLE : TLCK 25-4L

TLCK series circulator, K for cooling systems, port nominal diameter = 25, max head = 4 m, with port to port distance of 180 mm.

**TABLE OF MATERIALS**

PART	MATERIAL
Pump body	Cast iron cataphoretically coated
Impeller	Composite material
Shaft	Ceramics
Inner jacket	Stainless steel
Wear ring	Ceramics
Bearings	Ceramics
Gaskets	EPDM

tlck-2p50-en\_a\_tm

**TLCK SERIES  
HYDRAULIC PERFORMANCE TABLE**

PUMP TYPE	ABSORBED POWER	NOMINAL INTENSITY	CAPACITOR		SPEED	Q = DELIVERY								
						l/min 0	10	20	25	30	40	50	60	70
						m <sup>3</sup> /h 0	0,6	1,2	1,5	1,8	2,4	3,0	3,6	4,2
230V 50Hz	W	A	μF	V	min <sup>-1</sup>	H = TOTAL HEAD METRES COLUMN OF WATER								
TLCK 25-4L	40	0,19	2,0	400	1	2,9	2,6	2,1	1,9	1,6	1,0			
	59	0,28			2	3,5	3,2	2,9	2,6	2,4	1,8	1,2		
	70	0,33			3	4,0	3,8	3,4	3,3	3,0	2,5	2,0	1,3	
TLCK 25-6L	56	0,27	3,0	400	1	3,0	1,8	1,2	0,9	0,6				
	83	0,37			2	4,7	3,6	2,7	2,3	1,9	1,2	0,7		
	100	0,44			3	5,7	5,0	4,3	4,0	3,7	3,0	2,4	1,8	1,2

Performances according to standards EN 1151-1

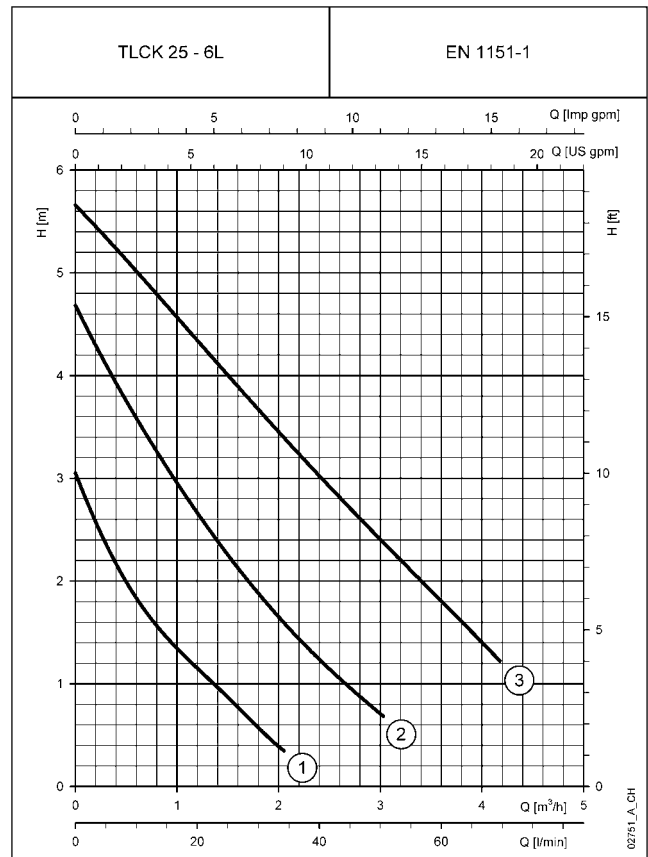
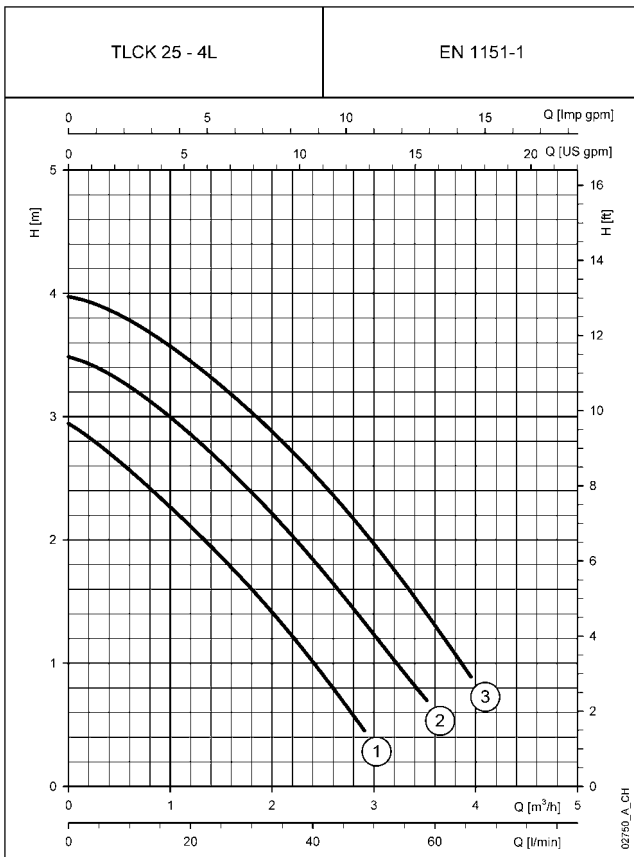
tlck-2p50-en\_a\_th



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## TLCK SERIES SINGLE-PHASE OPERATING CHARACTERISTICS



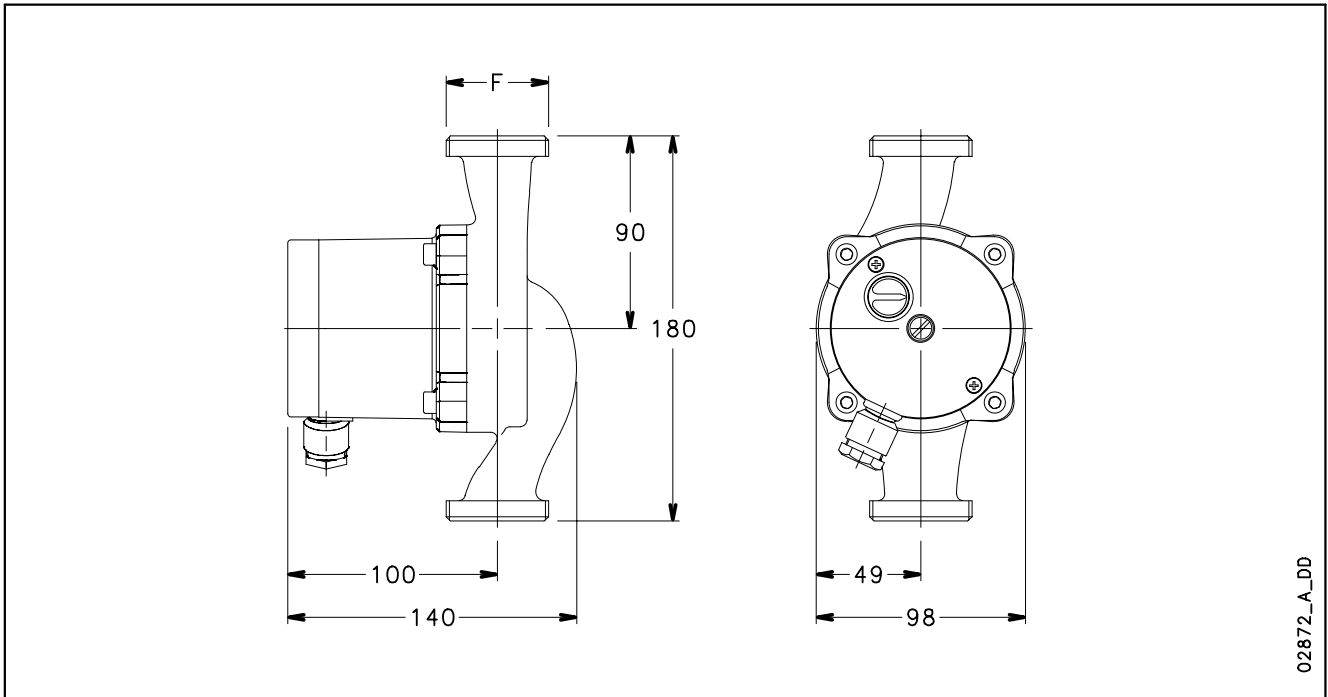
These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .



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## TLCK SERIES DIMENSIONS AND WEIGHTS



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## DIMENSIONS AND WEIGHTS TABLE

PUMP TYPE	DIMENSIONS (mm)		F	DN	WEIGHT
	H	H1			kg
TLCK 25-4L	180	90	R 1	25	3
TLCK 25-6L	180	90	R 1	25	3

tlck-2p50-en\_a\_td





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# **TECHNICAL APPENDIX**



## TECHNICAL APPENDIX VAPOUR PRESSURE PS VAPOUR PRESSURE AND $\rho$ DENSITY OF WATER TABLE

t °C	T K	ps bar	$\rho$ kg/dm <sup>3</sup>	t °C	T K	ps bar	$\rho$ kg/dm <sup>3</sup>	t °C	T K	ps bar	$\rho$ kg/dm <sup>3</sup>
0	273,15	0,00611	0,9998	55	328,15	0,15741	0,9857	120	393,15	1,9854	0,9429
1	274,15	0,00657	0,9999	56	329,15	0,16511	0,9852	122	395,15	2,1145	0,9412
2	275,15	0,00706	0,9999	57	330,15	0,17313	0,9846	124	397,15	2,2504	0,9396
3	276,15	0,00758	0,9999	58	331,15	0,18147	0,9842	126	399,15	2,3933	0,9379
4	277,15	0,00813	1,0000	59	332,15	0,19016	0,9837	128	401,15	2,5435	0,9362
5	278,15	0,00872	1,0000	60	333,15	0,1992	0,9832	130	403,15	2,7013	0,9346
6	279,15	0,00935	1,0000	61	334,15	0,2086	0,9826	132	405,15	2,867	0,9328
7	280,15	0,01001	0,9999	62	335,15	0,2184	0,9821	134	407,15	3,041	0,9311
8	281,15	0,01072	0,9999	63	336,15	0,2286	0,9816	136	409,15	3,223	0,9294
9	282,15	0,01147	0,9998	64	337,15	0,2391	0,9811	138	411,15	3,414	0,9276
10	283,15	0,01227	0,9997	65	338,15	0,2501	0,9805	140	413,15	3,614	0,9258
11	284,15	0,01312	0,9997	66	339,15	0,2615	0,9799	145	418,15	4,155	0,9214
12	285,15	0,01401	0,9996	67	340,15	0,2733	0,9793	155	428,15	5,433	0,9121
13	286,15	0,01497	0,9994	68	341,15	0,2856	0,9788	160	433,15	6,181	0,9073
14	287,15	0,01597	0,9993	69	342,15	0,2984	0,9782	165	438,15	7,008	0,9024
15	288,15	0,01704	0,9992	70	343,15	0,3116	0,9777	170	443,15	7,920	0,8973
16	289,15	0,01817	0,9990	71	344,15	0,3253	0,9770	175	448,15	8,924	0,8921
17	290,15	0,01936	0,9988	72	345,15	0,3396	0,9765	180	453,15	10,027	0,8869
18	291,15	0,02062	0,9987	73	346,15	0,3543	0,9760	185	458,15	11,233	0,8815
19	292,15	0,02196	0,9985	74	347,15	0,3696	0,9753	190	463,15	12,551	0,8760
20	293,15	0,02337	0,9983	75	348,15	0,3855	0,9748	195	468,15	13,987	0,8704
21	294,15	0,24850	0,9981	76	349,15	0,4019	0,9741	200	473,15	15,550	0,8647
22	295,15	0,02642	0,9978	77	350,15	0,4189	0,9735	205	478,15	17,243	0,8588
23	296,15	0,02808	0,9976	78	351,15	0,4365	0,9729	210	483,15	19,077	0,8528
24	297,15	0,02982	0,9974	79	352,15	0,4547	0,9723	215	488,15	21,060	0,8467
25	298,15	0,03166	0,9971	80	353,15	0,4736	0,9716	220	493,15	23,198	0,8403
26	299,15	0,03360	0,9968	81	354,15	0,4931	0,9710	225	498,15	25,501	0,8339
27	300,15	0,03564	0,9966	82	355,15	0,5133	0,9704	230	503,15	27,976	0,8273
28	301,15	0,03778	0,9963	83	356,15	0,5342	0,9697	235	508,15	30,632	0,8205
29	302,15	0,04004	0,9960	84	357,15	0,5557	0,9691	240	513,15	33,478	0,8136
30	303,15	0,04241	0,9957	85	358,15	0,5780	0,9684	245	518,15	36,523	0,8065
31	304,15	0,04491	0,9954	86	359,15	0,6011	0,9678	250	523,15	39,776	0,7992
32	305,15	0,04753	0,9951	87	360,15	0,6249	0,9671	255	528,15	43,246	0,7916
33	306,15	0,05029	0,9947	88	361,15	0,6495	0,9665	260	533,15	46,943	0,7839
34	307,15	0,05318	0,9944	89	362,15	0,6749	0,9658	265	538,15	50,877	0,7759
35	308,15	0,05622	0,9940	90	363,15	0,7011	0,9652	270	543,15	55,058	0,7678
36	309,15	0,05940	0,9937	91	364,15	0,7281	0,9644	275	548,15	59,496	0,7593
37	310,15	0,06274	0,9933	92	365,15	0,7561	0,9638	280	553,15	64,202	0,7505
38	311,15	0,06624	0,9930	93	366,15	0,7849	0,9630	285	558,15	69,186	0,7415
39	312,15	0,06991	0,9927	94	367,15	0,8146	0,9624	290	563,15	74,461	0,7321
40	313,15	0,07375	0,9923	95	368,15	0,8453	0,9616	295	568,15	80,037	0,7223
41	314,15	0,07777	0,9919	96	369,15	0,8769	0,9610	300	573,15	85,927	0,7122
42	315,15	0,08198	0,9915	97	370,15	0,9094	0,9602	305	578,15	92,144	0,7017
43	316,15	0,09639	0,9911	98	371,15	0,9430	0,9596	310	583,15	98,70	0,6906
44	317,15	0,09100	0,9907	99	372,15	0,9776	0,9586	315	588,15	105,61	0,6791
45	318,15	0,09582	0,9902	100	373,15	1,0133	0,9581	320	593,15	112,89	0,6669
46	319,15	0,10086	0,9898	102	375,15	1,0878	0,9567	325	598,15	120,56	0,6541
47	320,15	0,10612	0,9894	104	377,15	1,1668	0,9552	330	603,15	128,63	0,6404
48	321,15	0,11162	0,9889	106	379,15	1,2504	0,9537	340	613,15	146,05	0,6102
49	322,15	0,11736	0,9884	108	381,15	1,3390	0,9522	350	623,15	165,35	0,5743
50	323,15	0,12335	0,9880	110	383,15	1,4327	0,9507	360	633,15	186,75	0,5275
51	324,15	0,12961	0,9876	112	385,15	1,5316	0,9491	370	643,15	210,54	0,4518
52	325,15	0,13613	0,9871	114	387,15	1,6362	0,9476	374,15	647,30	221,20	0,3154
53	326,15	0,14293	0,9862	116	389,15	1,7465	0,9460				
54	327,15	0,15002	0,9862	118	391,15	1,8628	0,9445				

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**TABLE OF FLOW RESISTANCE IN 100 m OF STRAIGHT CAST IRON PIPELINE (HAZEN-WILLIAMS FORMULA C=100)**

FLOW RATE		NOMINAL DIAMETER in mm and INCHES																												
m <sup>3</sup> /h	l/min	15 1/2"	20 3/4"	25 1"	32 1 1/4"	40 1 1/2"	50 2	65 2 1/2"	80 3"	100 4"	125 5"	150 6"	175 7"	200 8"	250 10"	300 12"	350 14"	400 16"												
0,6	10	v hr	0,94 16	0,53 3,94	0,34 1,33	0,21 0,40	0,13 0,13	The hr values must be multiplied by: 0.71 for galvanized or painted steel pipes 0.54 for stainless steel or copper pipes 0.47 for PVC or PE pipes																						
0,9	15	v hr	1,42 33,9	0,80 8,35	0,51 2,82	0,31 0,85	0,20 0,29																							
1,2	20	v hr	1,89 57,7	1,06 14,21	0,68 4,79	0,41 1,44	0,27 0,49												0,17 0,16											
1,5	25	v hr	2,36 87,2	1,33 21,5	0,85 7,24	0,52 2,18	0,33 0,73												0,21 0,25											
1,8	30	v hr	2,83 122	1,59 30,1	1,02 10,1	0,62 3,05	0,40 1,03												0,25 0,35											
2,1	35	v hr	3,30 162	1,86 40,0	1,19 13,5	0,73 4,06	0,46 1,37												0,30 0,46											
2,4	40	v hr		2,12 51,2	1,36 17,3	0,83 5,19	0,53 1,75												0,34 0,59	0,20 0,16										
3	50	v hr		2,65 77,4	1,70 26,1	1,04 7,85	0,66 2,65												0,42 0,89	0,25 0,25										
3,6	60	v hr		3,18 108	2,04 36,6	1,24 11,0	0,80 3,71												0,51 1,25	0,30 0,35										
4,2	70	v hr		3,72 144	2,38 48,7	1,45 14,6	0,93 4,93												0,59 1,66	0,35 0,46										
4,8	80	v hr		4,25 185	2,72 62,3	1,66 18,7	1,06 6,32												0,68 2,13	0,40 0,59										
5,4	90	v hr			3,06 77,5	1,87 23,3	1,19 7,85												0,76 2,65	0,45 0,74	0,30 0,27									
6	100	v hr			3,40 94,1	2,07 28,3	1,33 9,54												0,85 3,22	0,50 0,90	0,33 0,33									
7,5	125	v hr			4,25 142	2,59 42,8	1,66 14,4												1,06 4,86	0,63 1,36	0,41 0,49									
9	150	v hr				3,11 59,9	1,99 20,2												1,27 6,82	0,75 1,90	0,50 0,69	0,32 0,23								
10,5	175	v hr				3,63 79,7	2,32 26,9												1,49 9,07	0,88 2,53	0,58 0,92	0,37 0,31								
12	200	v hr				4,15 102	2,65 34,4												1,70 11,6	1,01 3,23	0,66 1,18	0,42 0,40								
15	250	v hr				5,18 154	3,32 52,0												2,12 17,5	1,26 4,89	0,83 1,78	0,53 0,60	0,34 0,20							
18	300	v hr				3,98 72,8	2,55 24,6												1,51 6,85	1,00 2,49	0,64 0,84	0,41 0,28								
24	400	v hr				5,31 124	3,40 41,8	2,01 11,66	1,33 4,24	0,85 1,43	0,54 0,48	0,38 0,20																		
30	500	v hr				6,63 187	4,25 63,2	2,51 17,6	1,66 6,41	1,06 2,16	0,68 0,73	0,47 0,30																		
36	600	v hr				5,10 88,6	3,02 24,7	1,99 8,98	1,27 3,03	0,82 1,02	0,57 0,42	0,42 0,20																		
42	700	v hr				5,94 118	3,52 32,8	2,32 11,9	1,49 4,03	0,95 1,36	0,66 0,56	0,49 0,26																		
48	800	v hr				6,79 151	4,02 42,0	2,65 15,3	1,70 5,16	1,09 1,74	0,75 0,72	0,55 0,34																		
54	900	v hr				7,64 188	4,52 52,3	2,99 19,0	1,91 6,41	1,22 2,16	0,85 0,89	0,62 0,42																		
60	1000	v hr				5,03 63,5	3,32 23,1	2,12 7,79	1,26 2,63	0,83 1,08	0,53 0,51	0,34 0,20			0,42 0,20															
75	1250	v hr				6,28 96,0	4,15 34,9	2,65 11,8	1,70 3,97	1,18 1,63	0,87 0,77	0,66 0,40			0,53 0,27															
90	1500	v hr				7,54 134	4,98 48,9	3,18 16,5	2,04 5,57	1,42 2,29	1,04 1,08	0,80 0,56			0,69 0,42															
105	1750	v hr				8,79 179	5,81 65,1	3,72 21,9	2,38 7,40	1,65 3,05	1,21 1,44	0,93 0,75			0,87 0,75															
120	2000	v hr				6,63 83,3	4,25 28,1	2,72 9,48	1,89 3,90	1,39 1,84	1,06 0,96	0,68 0,32			0,68 0,32															
150	2500	v hr				8,29 126	5,31 42,5	3,40 14,3	2,36 5,89	1,73 2,78	1,33 1,45	0,85 0,49			0,85 0,49															
180	3000	v hr				59,5	59,5	20,1	8,26	2,08	3,90	1,59	1,02	1,02	0,69	0,71	0,28													
210	3500	v hr				79,1	79,1	26,7	11,0	2,43	5,18	1,86	1,19	1,19	0,83	0,38														
240	4000	v hr				101	101	34,2	14,1	2,77	6,64	2,12	1,36	1,17	0,94	0,48														
300	5000	v hr						51,6	21,2	3,47	10,0	2,65	1,70	1,18	0,73															
360	6000	v hr						8,15	5,66	4,16	3,18	2,04	1,42	1,02	0,64															
420	7000	v hr						72,3	29,8	14,1	7,33	2,47	1,70	1,18	0,82	1,21	0,64													
480	8000	v hr						50,7	23,9	12,49	4,21	2,72	1,89	1,39	0,82	1,39	0,82													
540	9000	v hr						8,49	6,24	4,78	3,06	2,12	1,56	1,19	0,65	1,19	0,65	1,19	0,65											
600	10000	v hr						63,0	29,8	15,5	5,24	2,16	1,42	1,02	0,73	1,33	0,82	1,33	0,82											
		v hr						6,93	5,31	3,40	6,93	2,62	1,89	1,33	0,82	1,33	0,82	1,33	0,82											

G-at-pct\_a\_th

hr = flow resistance for 100m of straight pipeline (m)  
V = water speed (m/s)

**FLOW RESISTANCE**
**TABLE OF FLOW RESISTANCE IN BENDS, VALVES AND GATES**

The flow resistance is calculated using the equivalent pipeline length method according to the table below:

ACCESSORY TYPE	DN											
	25	32	40	50	65	80	100	125	150	200	250	300
	Equivalent pipeline length (m)											
45° bend	0,2	0,2	0,4	0,4	0,6	0,6	0,9	1,1	1,5	1,9	2,4	2,8
90° bend	0,4	0,6	0,9	1,1	1,3	1,5	2,1	2,6	3,0	3,9	4,7	5,8
90° smooth bend	0,4	0,4	0,4	0,6	0,9	1,1	1,3	1,7	1,9	2,8	3,4	3,9
Union tee or cross	1,1	1,3	1,7	2,1	2,6	3,2	4,3	5,3	6,4	7,5	10,7	12,8
Gate	-	-	-	0,2	0,2	0,2	0,4	0,4	0,6	0,9	1,1	1,3
Non return valve	1,1	1,5	1,9	2,4	3,0	3,4	4,7	5,9	7,4	9,6	11,8	13,9

G-a-pcv\_a\_th

The table is valid for the Hazen Williams coefficient  $C = 100$  (cast iron pipework). For steel pipework, multiply the values by 1.41. For stainless steel, copper and coated cast iron pipework, multiply the values by 1.85.

When the **equivalent pipeline length** has been determined, the flow resistance is obtained from the table of flow resistance.

The values given are guideline values which are bound to vary slightly according to the model, especially for gate valves and non-return valves, for which it is a good idea to check the values supplied by the manufacturers.



## VOLUMETRIC CAPACITY

Litres per minute l/min	Cubic metres per hour m <sup>3</sup> /h	Cubic feet per hour ft <sup>3</sup> /h	Cubic feet per minute ft <sup>3</sup> /min	Imp. gal. per minute Imp. gal./min	US gal. per minute Us gal./min
<b>1,0000</b>	0,0600	2,1189	0,0353	0,2200	0,2640
16,6667	<b>1,0000</b>	35,3147	0,5886	3,6660	4,4030
0,4720	0,0283	<b>1,0000</b>	0,0167	0,1040	0,1250
28,3170	1,6990	60,0000	<b>1,0000</b>	6,2290	7,4800
4,5460	0,2728	9,6326	0,1605	<b>1,0000</b>	1,2010
3,7850	0,2271	8,0209	0,1337	0,8330	<b>1,0000</b>

## PRESSURE AND HEAD

Newton per square metre N/m <sup>2</sup>	kilo Pascal kPa	bar bar	Pound force per square inch psi	metre of water m H <sub>2</sub> O	millimetre di mercury mm Hg
<b>1,0000</b>	0,0010	1 x 10 <sup>-5</sup>	1,45 x 10 <sup>-4</sup>	1,02 x 10 <sup>-4</sup>	0,0075
1000,0000	<b>1,0000</b>	0,0100	0,1450	0,1020	7,5000
1 x 10 <sup>5</sup>	100,0000	<b>1,0000</b>	14,5000	10,2000	750,1000
6895,0000	6,8950	0,0690	<b>1,0000</b>	0,7030	51,7200
9789,0000	9,7890	0,0980	1,4200	<b>1,0000</b>	73,4200
133,3000	0,1333	0,0013	0,0190	0,0140	<b>1,0000</b>

## LENGHT

millimetre mm	centimetre cm	metre m	inch in	foot ft	yard yd
<b>1,0000</b>	0,1000	0,0010	0,0394	0,0033	0,0011
10,0000	<b>1,0000</b>	0,0100	0,3937	0,0328	0,0109
1000,0000	100,0000	<b>1,0000</b>	39,3701	3,2808	1,0936
25,4000	2,5400	0,0254	<b>1,0000</b>	0,0833	0,0278
304,8000	30,4800	0,3048	12,0000	<b>1,0000</b>	0,3333
914,4000	91,4400	0,9144	36,0000	3,0000	<b>1,0000</b>

## VOLUME

cubic metre m <sup>3</sup>	litre litro	millilitre ml	imp. gallon imp. gal.	US gallon US gal.	cubic foot ft <sup>3</sup>
<b>1,0000</b>	1000,0000	1 x 10 <sup>6</sup>	220,0000	264,2000	35,3147
0,0010	<b>1,0000</b>	1000,0000	0,2200	0,2642	0,0353
1 x 10 <sup>-6</sup>	0,0010	<b>1,0000</b>	2,2 x 10 <sup>-4</sup>	2,642 x 10 <sup>-4</sup>	3,53 x 10 <sup>-5</sup>
0,0045	4,5460	4546,0000	<b>1,0000</b>	1,2010	0,1605
0,0038	3,7850	3785,0000	0,8327	<b>1,0000</b>	0,1337
0,0283	28,3170	28317,0000	6,2288	7,4805	<b>1,0000</b>

G-at\_pp-en\_a\_sc







# ITT

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