



INTELLIGENT AIR OPERATED DIAPHRAGM PUMPS

edition 2017 rev 1

✓ Full control and feedback
intelligent pump control solution

✓ Ultra low start pressure
pump starts at 0.3 bar (4.4 PSI)

✓ Lower operational costs
reduced air consumption

Powered by

LEAP®
LOW ENERGY AIR PUMP TECHNOLOGY



» All about your flow

www.tapflo.com

All about your flow

Tapflo is a leading pump manufacturer with the ambition to provide a wide range of premium products for various industrial applications. We focus on delivering the best fluid processing solutions and support on all stages of the process, worldwide.



About Tapflo

Tapflo is an independent, Swedish, family owned, manufacturer and global supplier of air operated diaphragm pumps, centrifugal pumps and other industrial process equipment. The company was founded in Kungälv, Sweden in 1980 and has since then been working with design and manufacture of thermoplastic, metal and sanitary series diaphragm pumps and also with complete range of centrifugal pumps and industrial equipment. After years of dynamic development the company evolved into Tapflo Group with worldwide operations. Tapflo Group is represented by own companies and independent distributors all over the world on 6 continents.

Quality certified

At Tapflo we believe that quality is one of the highest values, both for our customers as well as our employees.

As a result, we comply with various globally recognised certification and quality control institutions. Many of our products comply with EC ATEX directives for equipment intended for use in explosion hazardous environments.

All our products are obviously CE marked and followed by our comprehensive instruction manuals. Tapflo manufacturing process is certified according to ISO 9001:2015.



EN 10204

Our values

■ Long term engagement is our core

Our aim is to continuously provide premium products according to evolving needs of our customers. That is why we see each customer relationship as a long term commitment.

■ Local means on your terms

Tapflo is your global partner providing local support. No matter where your plant is located you can expect us to support you locally.

■ Flexibility the foundation of good service

We are prepared to deal with reality, knowing that in practice this means answering questions, offering solutions and supplying spare parts with a minimal loss of time.

■ Customizing to bring the product to the needs

Our intention is always to help our clients find the most cost effective solutions to increase their company's efficiency. If this means changing the design of the pump we see it as a challenge - not a problem.

■ To produce is to develop

When you are actively involved in the manufacturing of a product, it is almost impossible not to discover ways to improve it. This allows us to frequently offer solutions that are even more sustainable and efficient.

TC series

Intelligent air operated diaphragm pumps

TC Intelligent pumps are fitted with ingenious LEAP® technology developed by Tapflo.











Powered by



LEAP® or 'Low Energy Air Pump' is a patented technology used in AODD pumps to reduce the minimum operating air pressure by reducing internal losses and friction found in conventional AODD pumps.

LEAP uses a unique indirect system to detect the position of the diaphragm shaft controlling the diaphragm movement automatically.

■ Features & Benefits

- | | |
|--|--|
|  Available in Plastic, Metal and Sanitary series AODD pumps
TC50 - TC425 (T50 - T425 equivalent) |  Noise Reduction
ability to utilise lower air pressure reduces the noise of the pump |
|  Retrofit
Leap can be fitted to any existing Tapflo Air Operated Diaphragm Pumps |  Improved Lifespan
the TC series uses an air valve that has a significantly longer life expectancy over rubber seal technology. |
|  Batch Dispensing
allowing the pump to automatically stop after the required volume has been dispensed. |  Improved Maintenance
main air valve can be changed in under two minutes without the removal of the pump from the process line. |
|  Electrical feedback
signal allows for external monitoring of the pump process. |  Control Simplification
no need for an external pneumatic solenoid valve, reducing costs and simplifying control. |
|  Dry Running
by analysing the frequency of pulses, the pump can analyse when it is running dry. |  Dead Heading
as with dry running, the frequency of pulses can be monitored, alerting if the pump has a blockage. |



Sustainable energy management
Achieve up to **70% energy savings**



TC series

Energy Savings

Tests undertaken to measure the performance of a standard pump against the new **TC intelligent pump** have resulted in an **energy saving of up to 70%**.

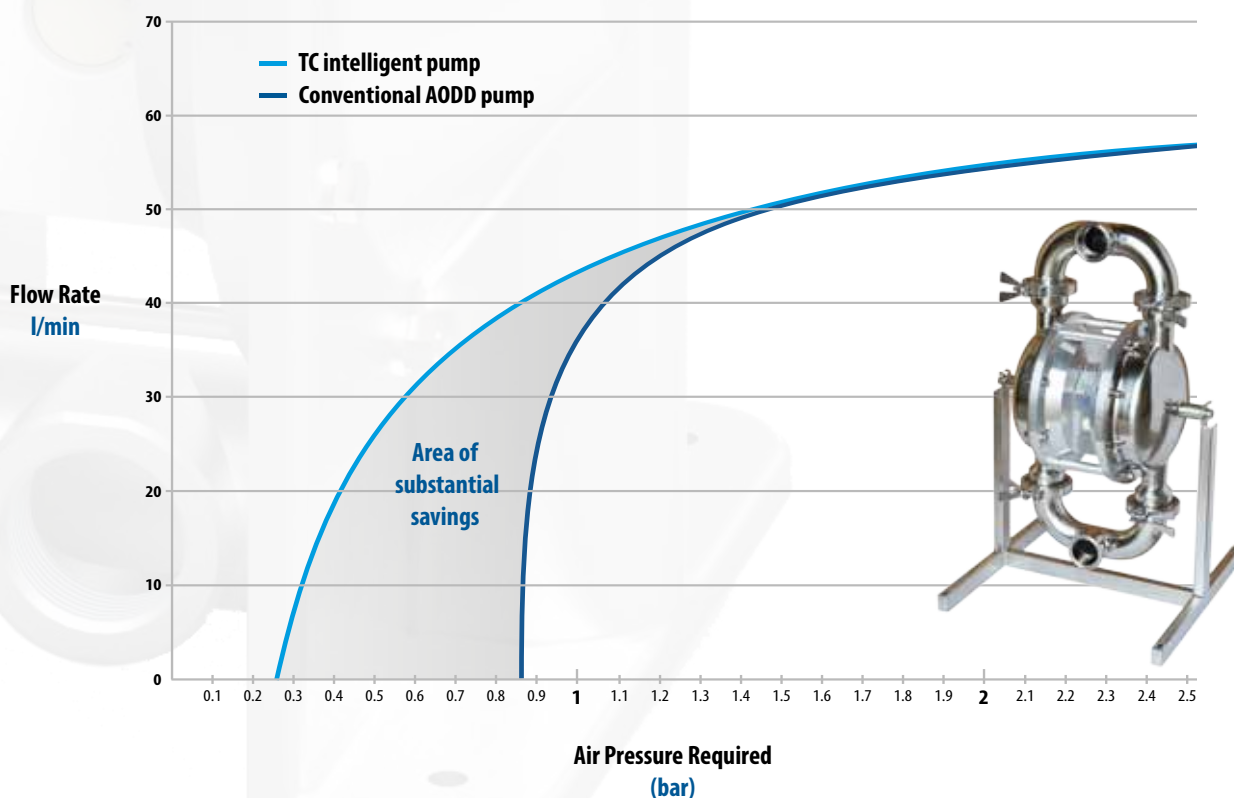
The extensive testing procedure has shown that the largest amount of energy required by a pump is used to overcome the resistance created by the pump itself. Another major issue is found in the mid-port scenario, wherein the attempt to save energy by turning down the air pressure to a much lower level causes the stall of the pump.

The pump fitted with LEAP® Technology is able to **start pumping at 0.3 bar without stalling**, in test the pump was already achieving flow rates of **70% of its maximum open end flow before other pumps had even started**.

At 0.3 bar (4.4 Psi) a standard Tapflo T50 pump fitted with LEAP® Technology was already pumping at over 23 l/min, all other air pumps tested failed to even start.



Graph showing fluid flow against air pressure required



TC series

A new generation of diaphragm pump

The **TC Intelligent pump** can operate in two settings, Internal and External Pilot.

Internal Pilot

In standard conditions the pump runs with a single **air supply from 0.3 bar**, deriving air supply to the control module from the Internal Pilot - main air supply.

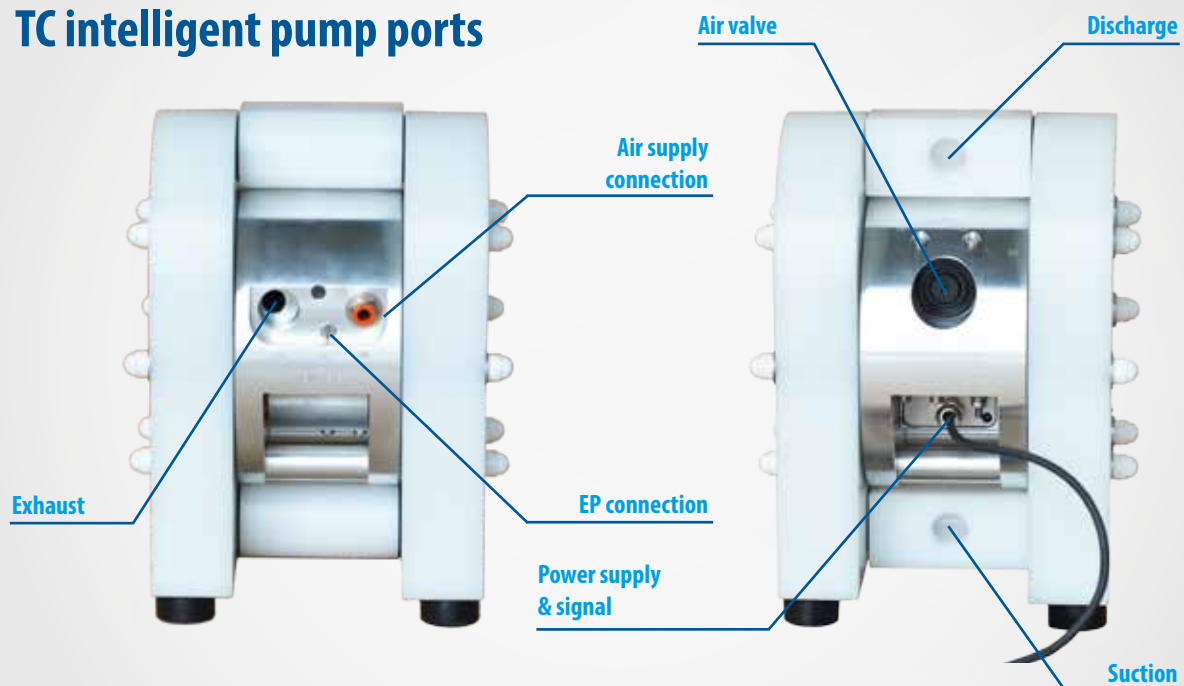
External Pilot

In some applications however, there may be a need to use the External Pilot - a separate (additional) air supply to the LEAP module.

The EP assists in moving the air valve in application of:

- **Extremely low pressure** - it supports shifting of the air valve;
- **High pressure of 8 bar** - to create an air cushion preventing the air valve from being fired backwards and forwards.

TC intelligent pump ports



New air valve generation

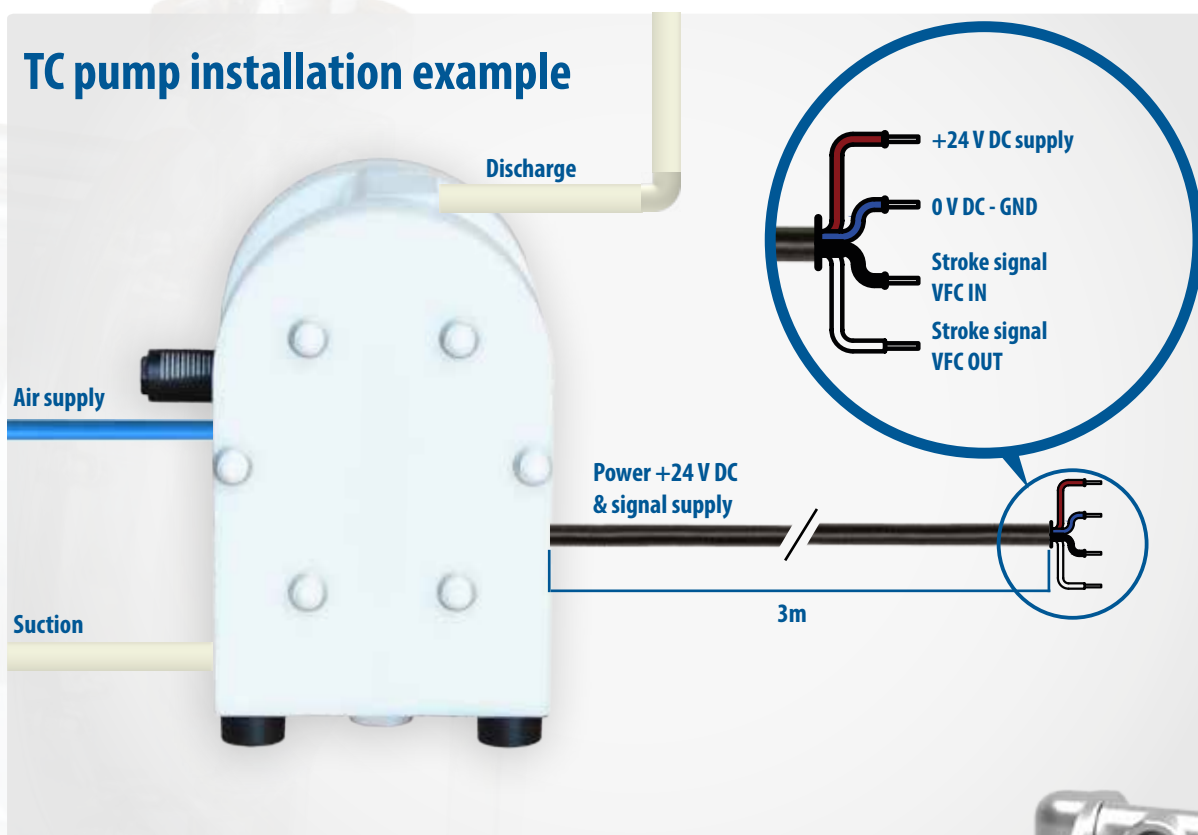
The new generation TC lube free air valve is easily taken out for servicing without dismantling of the pump.



TC series

A new generation of diaphragm pump

TC pump installation example



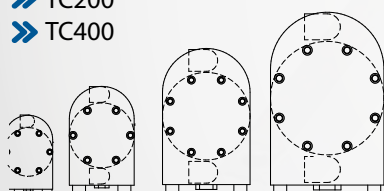
The TC series intelligent pump requires 24 V DC to run.



TC intelligent pumps range

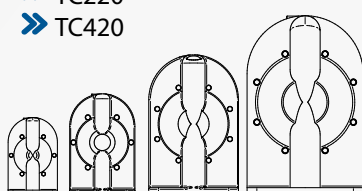
PE & PTFE pumps

- » TC50
- » TC100
- » TC200
- » TC400



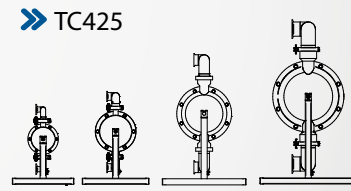
Metal pumps

- » TC70
- » TC120
- » TC220
- » TC420



Sanitary pumps

- » TC80
- » TC125
- » TC225
- » TC425



Performance

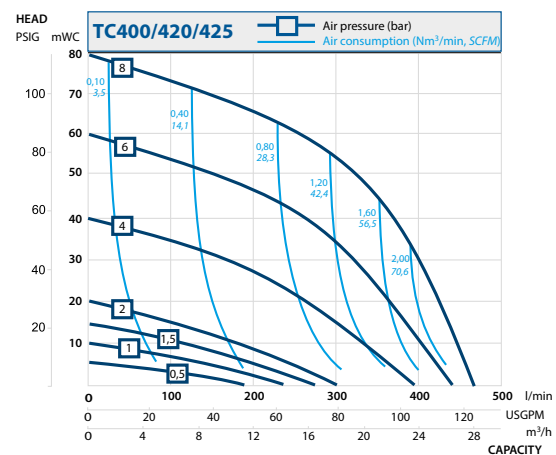
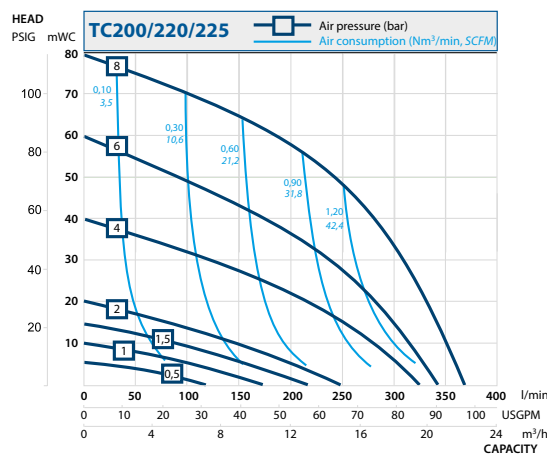
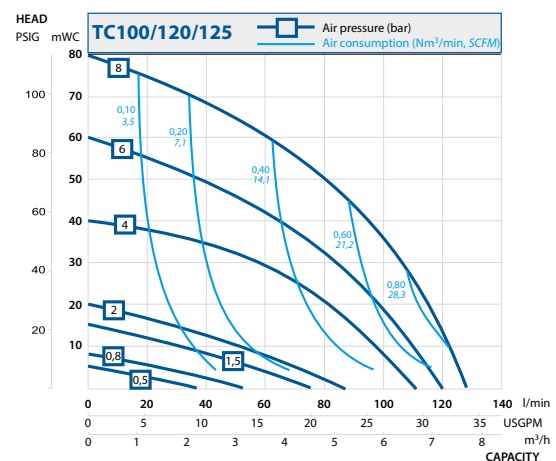
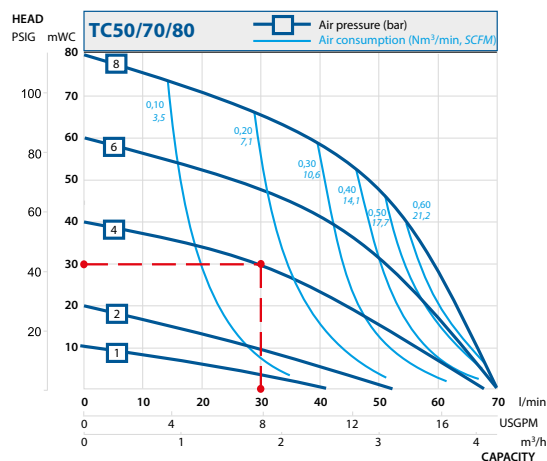
The performance curves are based on water at 20°C. Other circumstances might change the performance. See below how the capacity will change at different viscosities and suction lifts.

Performance curves

Example see the red line — — — — —

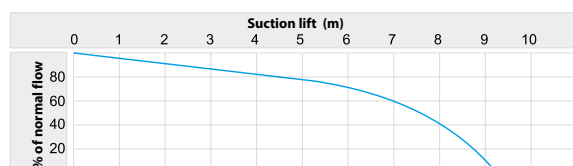
A flow of 30 litres/minute is desired. The discharge head is calculated to 30 mWC.

We choose a TC70. It requires an air pressure of 4 bar and will consume approximately 0.20 Nm³ air per minute.

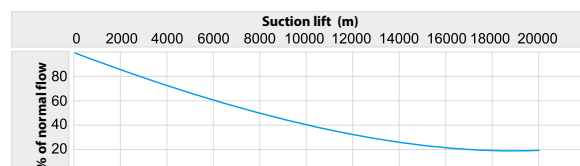


Capacity changes

Capacity changes at different suction lifts



Capacity changes at different viscosities



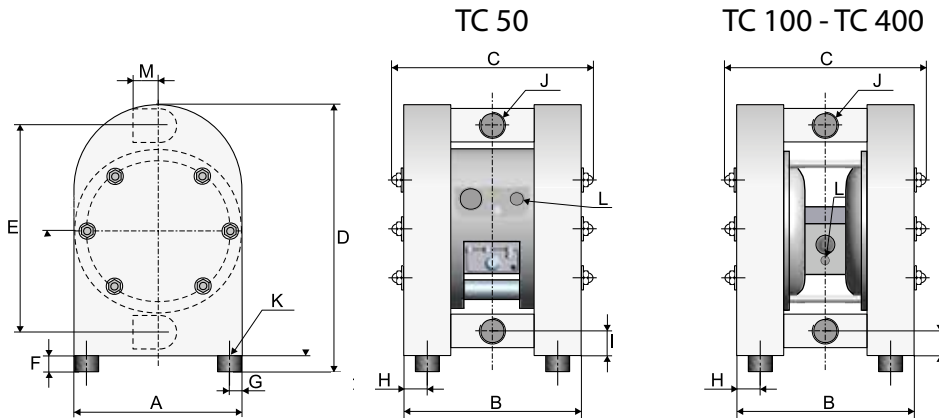
Performance curves are based on Metal series pumps. Should you need detailed performance curves for other executions please contact us.
Changes reserved without notice

Dimensions & technical data

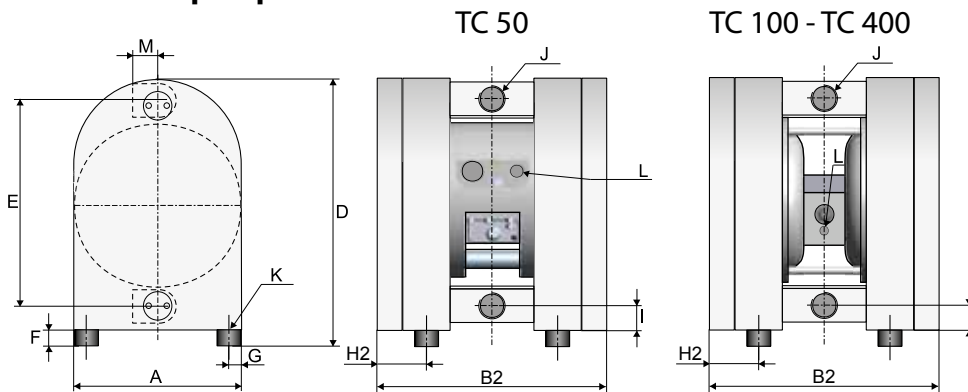
TC PE & PTFE pumps

Dimensions

PE pumps



PTFE pumps



Dimensions in mm (where other is not indicated)
Dimensions in inch (where other is not indicated)

Dim	Pump size			
	TC 50	TC 100	TC 200	TC 400
A	150	200	270	350
	5.91	7.87	10.63	13.78
B	169	214	310	380
	6.30	8.43	12.20	14.96
B2	200	254	350	420
	7.87	10.00	13.78	16.54
C	190	250	345	425
	7.48	9.84	13.58	16.73
D	243	320	450	563
	9.57	12.60	17.72	22.17
E	190	252	345	440
	7.48	9.92	13.58	17.32
F	15	15	30	30
	0.59	0.59	1.18	1.18
G	17	30	30	30
	0.67	1.18	1.18	1.18
H	16	30	30	30
	0.63	1.18	1.18	1.18
H2	36	50	50	30
	1.41	1.96	1.96	1.18
I	20	28	38	48
	0.79	1.10	1.50	1.89
J	1/2"	1"	1 1/2"	2"
	1/2	1	1 1/2	2
K	M8x25	M8x25	M8x25	M8x25
	M8	M8	M8	M8
L	1/4"	1/4"	1/2"	1/2"
	1/4	1/4	1/2	1/2
M	25	38	54	70
	0.98	1.50	2.13	2.76

General dimensions only, ask us for detailed drawings.
Changes reserved without notice

Technical data

Data	Pump size			
	TC 50	TC 100	TC 200	TC 400
General characteristics				
*Max capacity (l/min) / (US gpm)	60 / 15.8	125 / 33	330 / 87	570 / 150
**Volume per stroke (ml) / (cu in)	87.5 / 5.34	280 / 17.1	933 / 56.9	2300 / 140.3
Max discharge pressure (bar) / (psi)	8 / 116	8 / 116	8 / 116	8 / 116
Max air pressure (bar) / (psi)	8 / 116	8 / 116	8 / 116	8 / 116
***Max suction lift dry (m) / (Ft)	2.5 / 8	3.5 / 11	4 / 13	4 / 13
Max suction lift wet (m) / (Ft)	9 / 29.5	9 / 29.5	9 / 29.5	9 / 29.5
Max size of solids (ø in mm) / (in)	4 / 0.16	6 / 0.24	10 / 0.39	15 / 0.59
Max temp, pump in PE (°C) / (°F)	70 / 158	70 / 158	70 / 158	70 / 158
Max temp, pump in PTFE (°C) / (°F)	100 / 212	100 / 212	100 / 212	100 / 212
Min temperature (°C) / (°F)	-20 / -4	-20 / -4	-20 / -4	-20 / -4
Weight				
TC pump in PE (kg) / (lb)	5,5 / 12	11 / 24	25 / 55	46 / 101
TC pump in PTFE (kg) / (lb)	10 / 22	18 / 40	45 / 99	92 / 203

* = Recommended flow is half of the max flow, i.e. recommended flow for a TC100 is 50 l/min (13.2 US gpm)

** = The value is based on pumps with EPDM diaphragms. Pumps with PTFE diaphragms have about 15% less volume

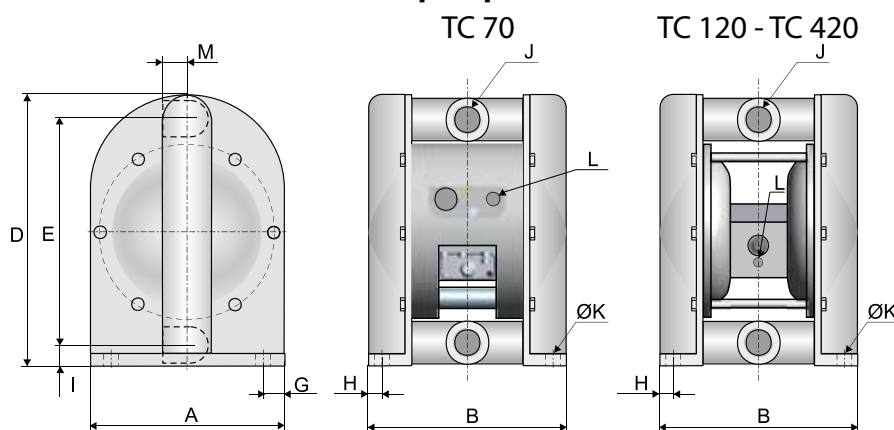
*** = This is max value with stainless steel valve balls, other valve ball materials may reduce the suction. Please consult us.



TC Metal pumps

Dimensions

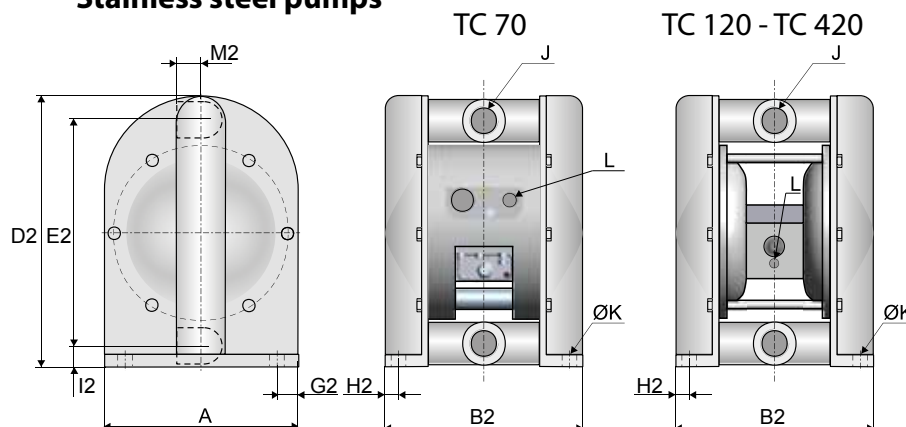
Aluminium and cast iron pumps



Dimensions in mm (where other is not indicated)
Dimensions in inch (where other is not indicated)

Dim	Pump size			
	TC 70	TC 120	TC 220	TC 420
A	150	200	270	350
	5.91	7.87	10.63	13.78
B	168	195	265	342
	6.61	7.68	10.43	13.46
B2	156	204	280	344
	6.14	8.03	11.02	13.54
D	229	302	412	537
	9.02	11.89	16.22	21.14
D2	229	310	422	529
	9.02	12.20	16.61	20.83
E	190	252	346	449
	7.48	9.92	13.62	17.68
E2	192	257	348	442
	7.56	10.12	13.70	17.40
G	17	20	25	35
	0.67	0.79	0.98	1.38
G2	17	20	31	35
	0.67	0.79	1.22	1.38
H	19	20	28	33
	0.75	0.79	1.10	1.30
H2	13	23	34	32
	0.51	0.91	1.34	1.26
I	20	27	34	48
	0.79	1.06	1.34	1.89
I2	19	27	36	45
	0.75	1.06	1.42	1.77
J	3/4"	1"	1 1/2"	2"
	3/4	1	1 1/2	2
ØK	8.5	8.5	8.5	8.5
	0.33	0.33	0.33	0.33
L	1/4"	1/4"	1/2"	1/2"
	1/4	1/4	1/2	1/2
M	29	33	44	57
	1.14	1.30	1.73	2.24
M2	40	52	70	90
	1.57	2.05	2.76	3.54

Stainless steel pumps



Technical data

General dimensions only, ask us for detailed drawings.
Changes reserved without notice

Data	Pump size			
	TC 70	TC 120	TC 220	TC 420
General characteristics				
*Max capacity (l/min) / (US gpm)	78 / 20	158 / 41	330 / 87	570 / 150
**Volume per stroke (ml) / (cu in)	87.5 / 5.34	420 / 25.6	933 / 56.9	2300/140.3
Max discharge pressure (bar) / (psi)	8 / 116			
Max air pressure (bar) / (psi)	8 / 116			
*** Max suction lift dry (m) / (Ft)	3 / 9.8	4 / 13	4 / 13	4 / 13
Max suction lift wet (m) / (Ft)	8 / 26	9 / 29.5	9 / 29.5	9 / 29.5
Max size of solids (ø in mm) / (in)	4 / 0.16	6 / 0.23	10 / 0.40	15 / 0.59
Max temp with EPDM/NBR (°C) / (°F)	80 / 176			
Max temp with PTFE (°C) / (°F)	110 / 230			
Min temperature (°C) / (°F)	-20 / -4			
Weight				
TC pump in alu (kg) / (lb)	6 / 13	9 / 20	21 / 46	37 / 82
TC pump cast iron (kg) / (lb)	12 / 26	18 / 40	46 / 101	83 / 183
TC pump in AISI 316 (kg) / (lb)	7.5 / 17	17 / 37	39 / 86	70 / 154

* = Recommended flow is half of the max flow, i.e. recommended flow for a TC120 is 60 l/min (15.9 US gpm).

** = The value is based on pumps with EPDM diaphragms. Pumps with PTFE diaphragms have about 15% less volume.

*** = This is max value with stainless steel valve balls, other valve ball materials may reduce the suction. Please consult us.



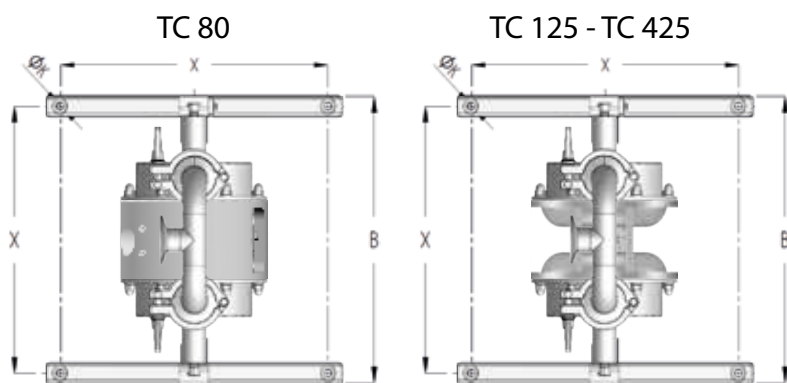
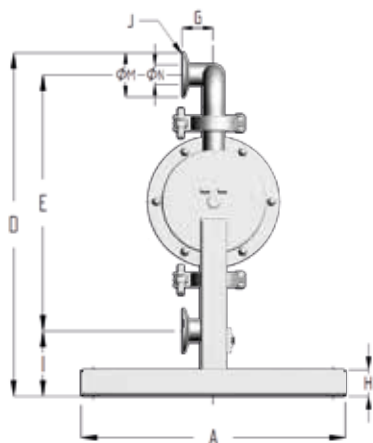
Dimensions & technical data

TC Sanitary pumps

Dimensions

Dimensions in mm (where other is not indicated)

Dimensions in inch (where other is not indicated)



Dim	Pump size			
	TC 80	TC 125	TC 225	TC 425
A	303	328	412	476
	11.9	12.9	16.2	18.7
B	295	320	404	468
	11.6	12.6	15.9	18.4
D	393	458	646 / 792**	808 / 950**
	15.5	18	25.4 / 31.1	31.8 / 37.4
E	294	350	528 / 690**	664 / 775**
	11.6	13.8	20.6 / 27.2	26.1 / 30.5
G	36	44	50	80
	1.4	1.7	2.0	3.1
H	30	30	30	30
	1.2	1.2	1.2	1.2
I	73	71	86	97
	2.9	2.8	3.4	3.8
J	TC ¹	1"	1 1/2"	2"
	DIN ²	DN25	DN40	DN50
	SMS ³	25	38	51
	RJT	1"	1 1/2"	2"
K	9	9	9	9
	0.4	0.4	0.4	0.4
Air inlet size	1/4"	1/4"	1/2"	1/2"
	1/4	1/4	1/2	1/2
ØM*	50.5	50.5	64	91
	2.0	2.0	2.5	3.6
ØN*	22.6	35.6	49	66
	0.9	1.4	1.9	2.6
X	275	300	384	448
	10.8	11.8	15.1	17.6

* = Dimensions for standard clamp connections only

1 = Clamp connections/pipes according to SMS3017/ ISO2037 (T425)

2 = Threaded connections according to DIN 11851

3 = Threaded connections according to SMS 1145

General dimensions only, ask us for detailed drawings.

Changes reserved without notice

Technical data

Data	Pump size			
	TC 80	TC 125	TC 225	TC 425
General characteristics				
*Max capacity (l/min) / (US gpm)	78 / 20.6	155 / 41	330 / 87	570 / 150
**Volume per stroke (ml) / (cu in)	87.5 / 5.34	300 / 18.3	933 / 56.9	2300 / 140.3
Max discharge pressure (bar) / (psi)	8 / 116	8 / 116	8 / 116	8 / 116
Max air pressure (bar) / (psi)	8 / 116	8 / 116	8 / 116	8 / 116
***Max suction lift dry (m) / (Ft)	3 / 9.8	4 / 13	4 / 13	4 / 13
Max suction lift wet (m) / (Ft)	8 / 26	9 / 29.5	9 / 29.5	9 / 29.5
Max size of solids (ø in mm) / (in)	4 / 0.16	6 / 0.24	10 / 0.39	15 / 0.59
Max temperature (°C) / (°F)	110 / 230	110 / 230	110 / 230	110 / 230
Weight				
Weight (kg) / (lb)	8,5 / 19	12 / 26	22 / 49	37 / 82

* = Recommended flow is half of the max flow, i.e. recommended flow for a TC125 is 60 l/min (15.9 US gpm).

** = The value is based on pumps with EPDM diaphragms. Pumps with PTFE diaphragms have about 15% less volume.

*** = This is max value with stainless steel valve balls, other valve ball materials may reduce the suction. Please consult us.



Tapflo intelligent solutions

Guardian systems



The Guardian is an energy conservation device designed to protect an air operated double diaphragm (AODD) pump from operating in an inefficient manner that uses unnecessary energy and reduces the life of its parts. It also offers the added benefit of providing greater safety to applications of high risk.

The Guardian directly monitors the discharge fluid pressure against its set point stopping the pump if the media pressure increases above the set point (closed valve) or falls below the set point (dry-run) dependant on configuration.

Applications of Guardian systems

Barrier Protection

Barrier pumps (TB) have an additional set of diaphragms used to back-up the primary diaphragms. In case of a breach the liquid remains inside the pump, instead of leaking out through the air exhaust. The Guardian monitors the pressure between the primary and secondary diaphragms, stopping the pump if the pressure increases above the set point.

Dry run & stop

The Guardian monitors the fluid discharge pressure of the pump, stopping it if the pressure falls below the set point, caused by a lack of media on the suction causing air to be ingested into the pump.

Dead head & stop

The Guardian monitors the fluid discharge pressure of the pump, stopping it if the pressure rises to the set point, caused by a closed valve or over pressure in the discharge line.

Dead head & restart

The Guardian monitors the fluid discharge pressure of the pump, stopping it if the pressure rises to the set point, caused by a closed valve or over pressure in the discharge line. When the pressure falls below the set pressure, the pump automatically restarts.



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Tapflo products and services are available in 75 countries on 6 continents.

Tapflo is represented worldwide by own Tapflo Group Companies and carefully selected distributors assuring highest Tapflo service quality for our customers' convenience.

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