tapflo®

INTELLIGENT AIR OPERATED DIAPHRAGM PUMPS

2020 | 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™

We began our journey 40 years ago in Kungälv, a small town on the Swedish west coast, as a family company with an ambition to one day become a global player on the pump market.

Since 1980, we have taken pride in delivering a wealth of knowledge and passion for pumps to the industry, whilst supplying a wide range of premium products for various industrial applications.

Over the years, the company has developed into a global Tapflo Group with branches and distributors present in nearly every region of the world.

One thing did not change - we are still a family company.

Our solutions are designed and manufactured in Europe and distributed globally to offer the best service and flow solutions to our customers for a variety of applications.

Our values, Commitment, Quality and Simplicity are reflected both in our product and business approach.

For fast and flexible service and high-quality products readily available worldwide, choose Tapflo.

Quality commitment

At Tapflo we are simply committed to quality. As a result, our production standards, as well as products quality, comply with various globally recognised certification and quality control standards. The Tapflo manufacturing process is certified according to ISO 9001:2015, confirming that our processes are appropriate, effective, customer-focused and continuously improved.

CE ISO 9001 2015 FDA **EN 10204**

Tapflo values

Our culture is concluded in Our values

Commitment

We are different from our competitors because of our willingness to exceed the customers' expectations, move fast and be flexible. Our culture is based on the spirit of togetherness, enthusiasm and integrity. We come from all over the world but we share the same values and we respect each other. We are committed.

Quality

We understand that the quality in our work is never better than the weakest link, that's why we focus on every small detail. We share a common passion for continuously finding more efficient and effective ways to provide value to our customers. As a manufacturer we have control of the complete process both in terms of our products and the way we operate internally. That is why we manufacture the highest quality pumps in our segment.

Simplicity

We have a saying, "Simple is art" which means we try to find smooth and uncomplicated solutions in everything. By keeping it simple we can focus on the essential, like designing uncomplicated pumps with few components. For us it is a key to success; strive to simplify what is complex.

TC series

Intelligent air operated diaphragm pumps

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

Powered by LEAP® LOW ENERGY AIR PUMP TECHNOLOGY

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

Premium quality of Sweden since 1980 tapflo

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

TC series

Energy Savings

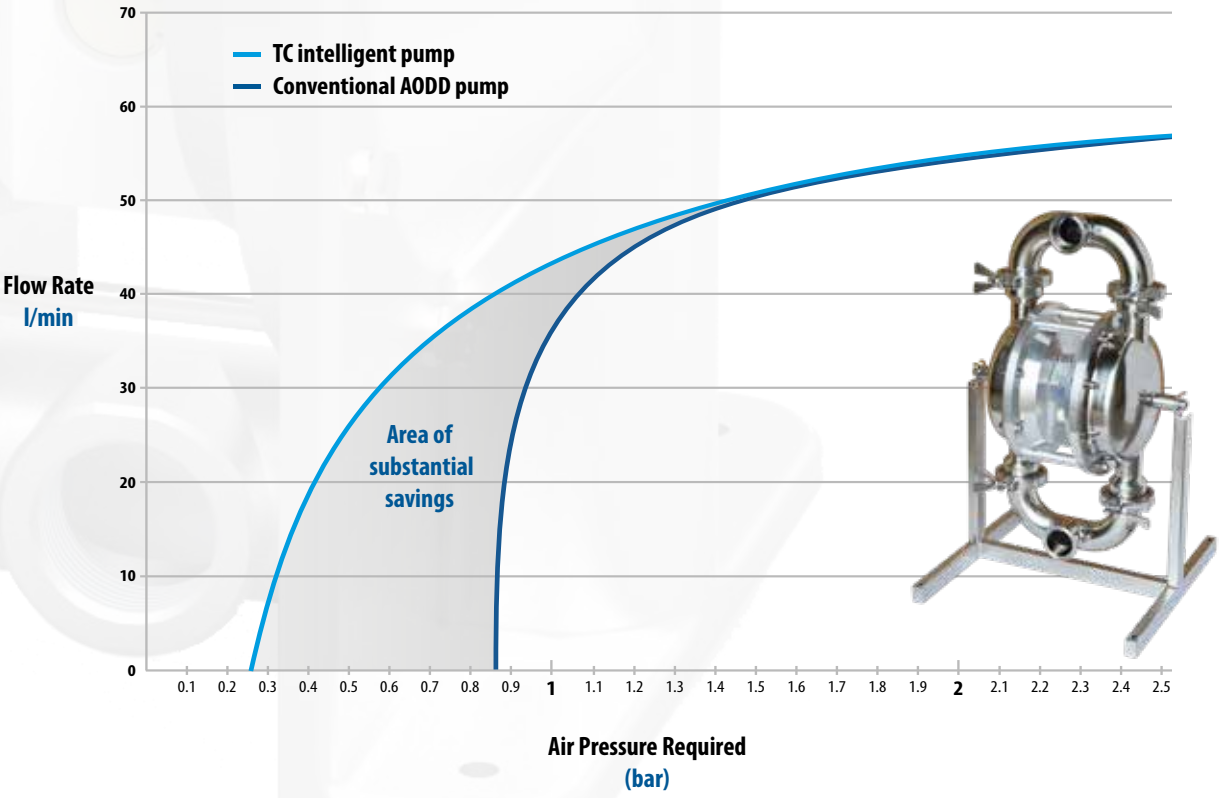
Tests undertaken to measure the performance of a standard pump against the new **TC intelligent pump** have resulted in an **energy saving of up to 70%.**

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.

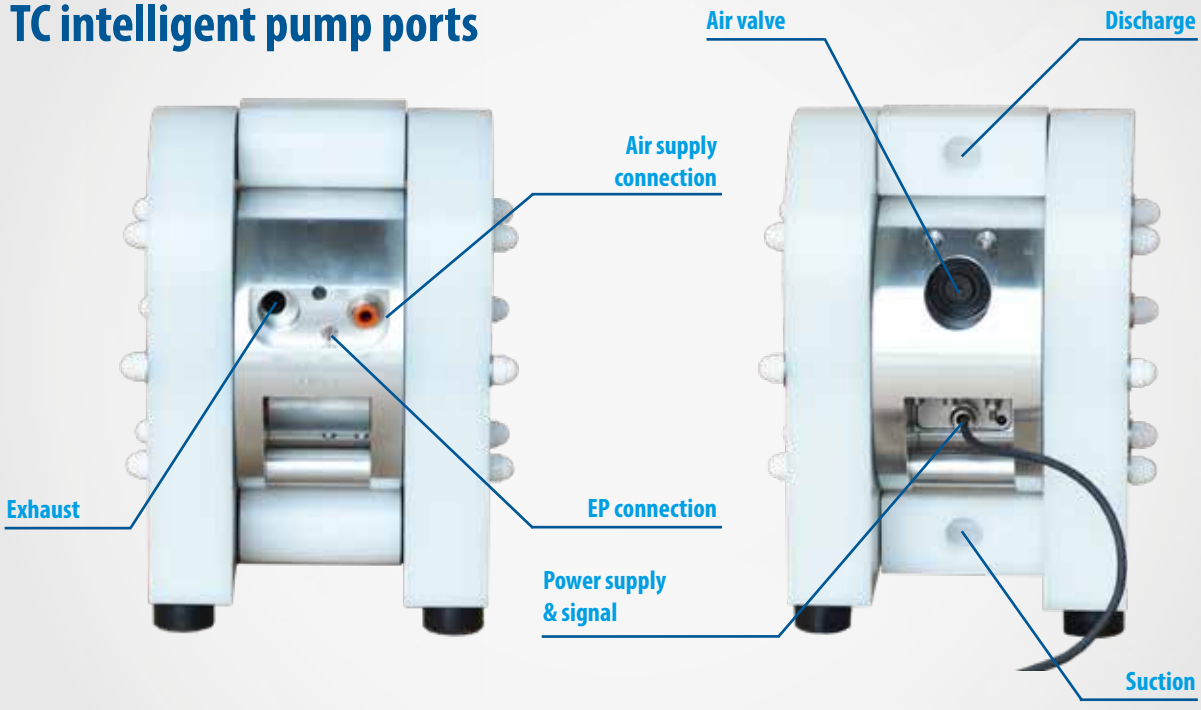
External Pilot

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

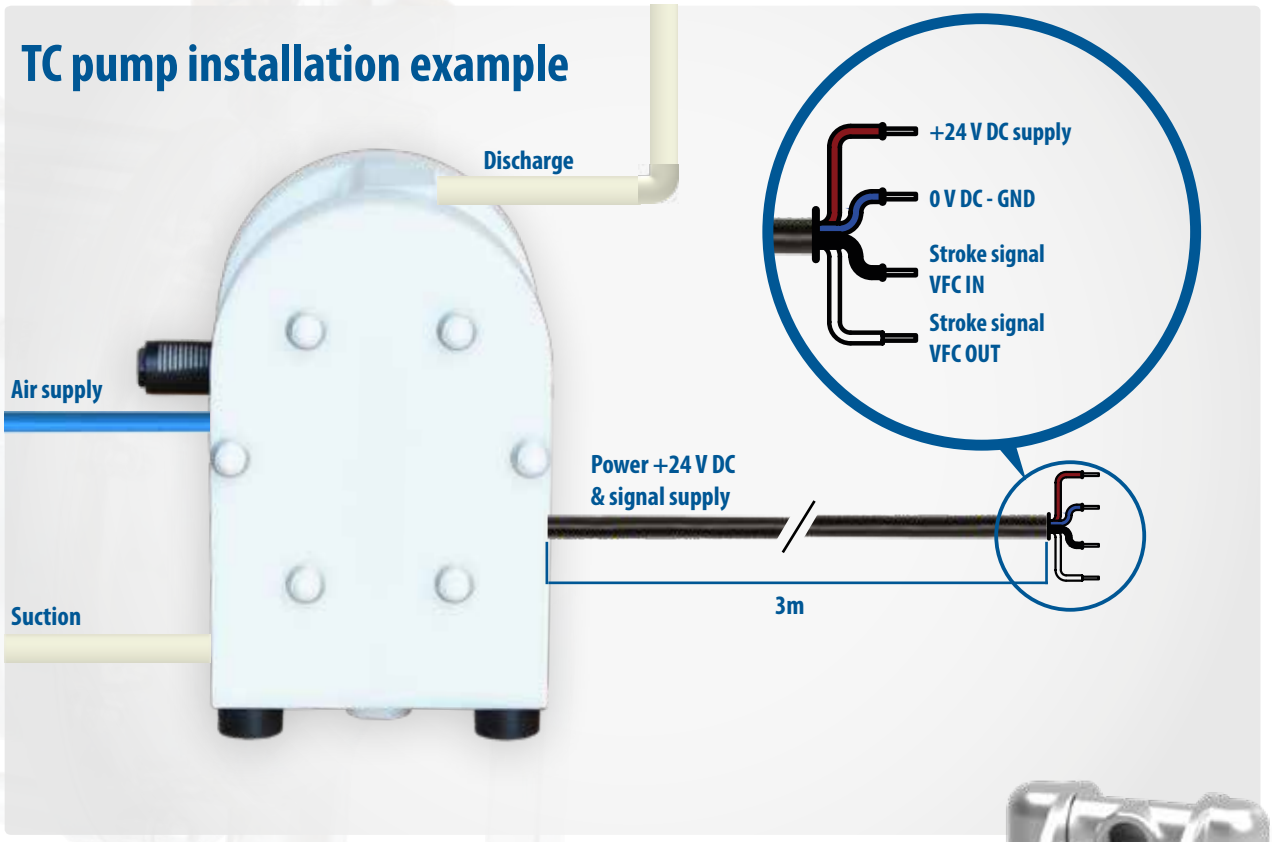
The new generation TC lube free air valve is easily taken out for servicing without dismantling of the pump.

TC intelligent pump
Air valve

TC series

A new generation of diaphragm pump

TC pump installation example

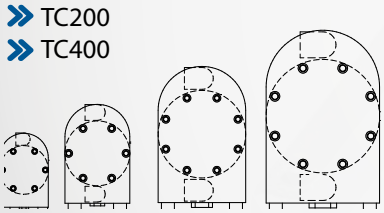


The TC series intelligent pump requires 24 V DC to run.

TC intelligent pumps range

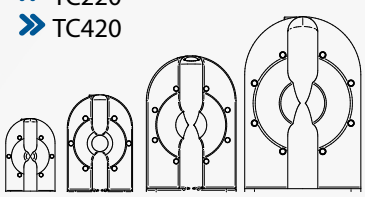
PE & PTFE pumps

- TC50
- TC100
- TC200
- TC400



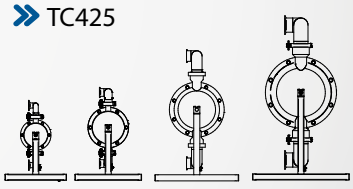
Metal pumps

- TC70
- TC120
- TC220
- TC420



Sanitary pumps

- TC80
- TC125
- TC225
- TC425



Performance

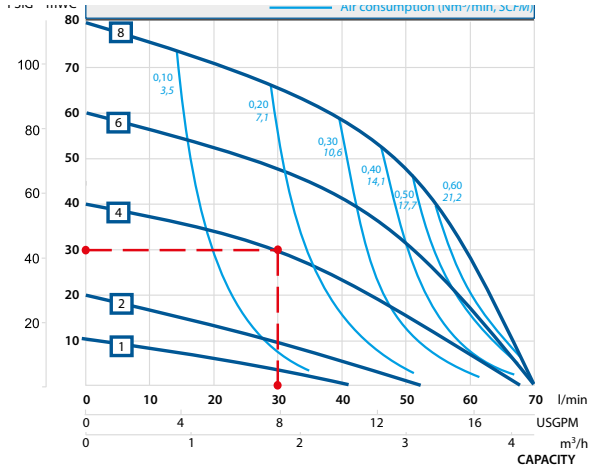
The performance curves are based on water at 20°C. Other circumstances might change the performance. See below how the capacity will change at different viscosities and suction lifts.

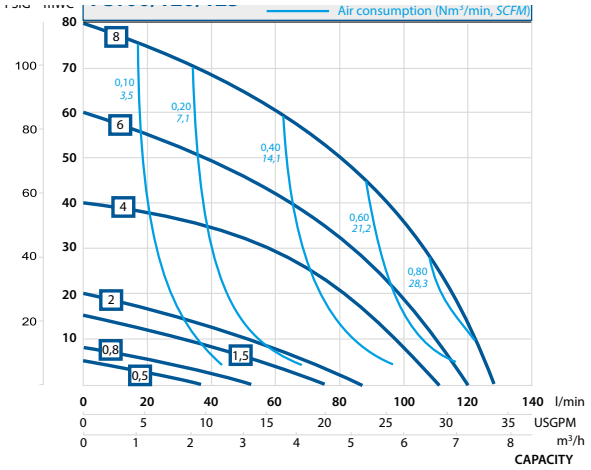
Performance curves

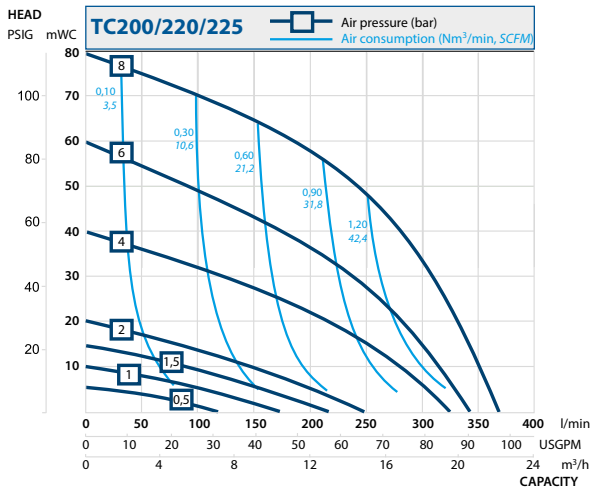
Example see the red line

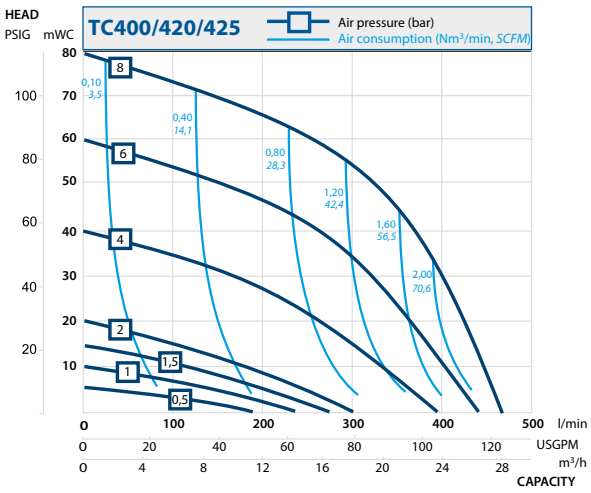
A flow of 30 litres/minute is desired. The discharge head is calculated to 30 mWC.

We choose a TC70. It requires an air pressure of 4 bar and will consume approximately 0.20 Nm^3 air per minute.



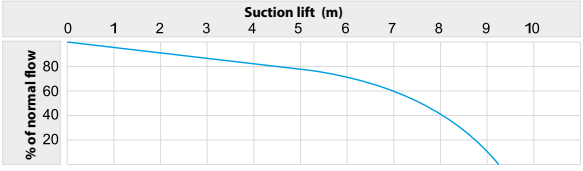




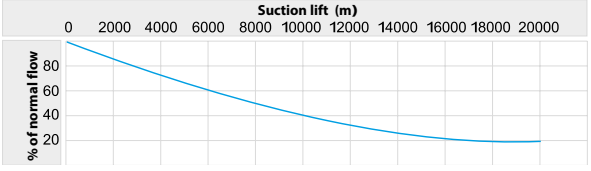


Capacity changes

Capacity changes at different suction lifts



Capacity changes at different viscosities



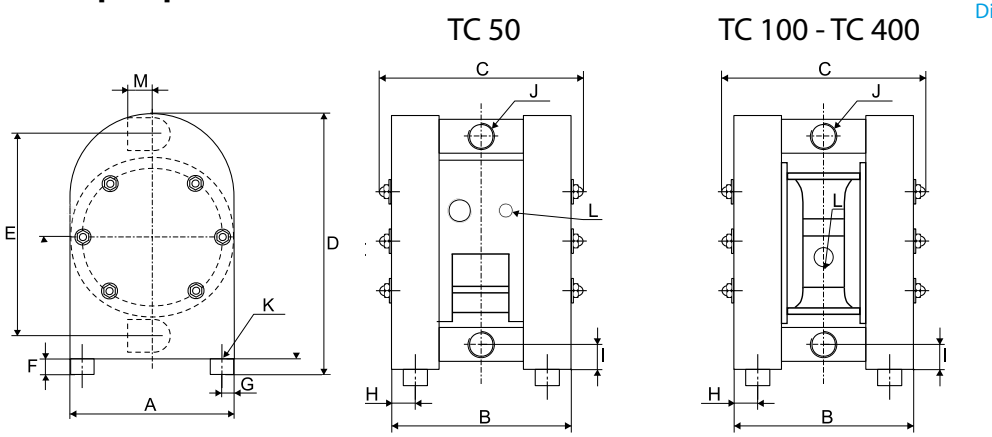
Performance curves are based on Metal series pumps. Should you need detailed performance curves for other executions please contact us.
Changes reserved without notice

Dimensions & technical data

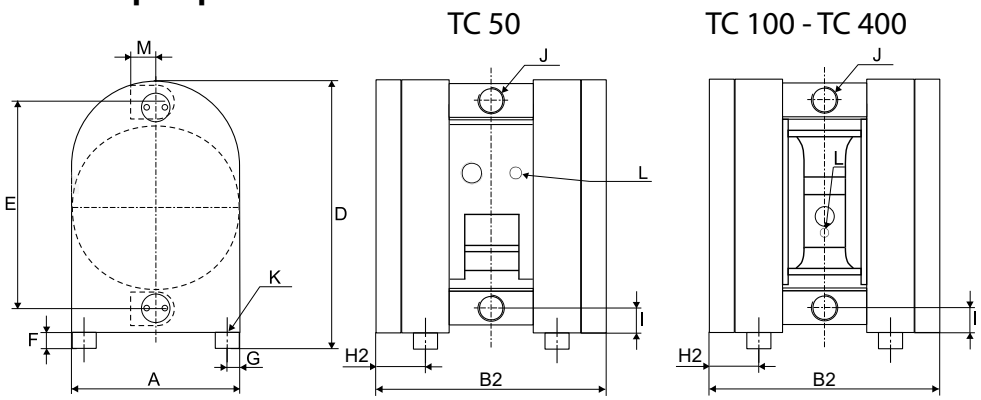
TC PE & PTFE pumps

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

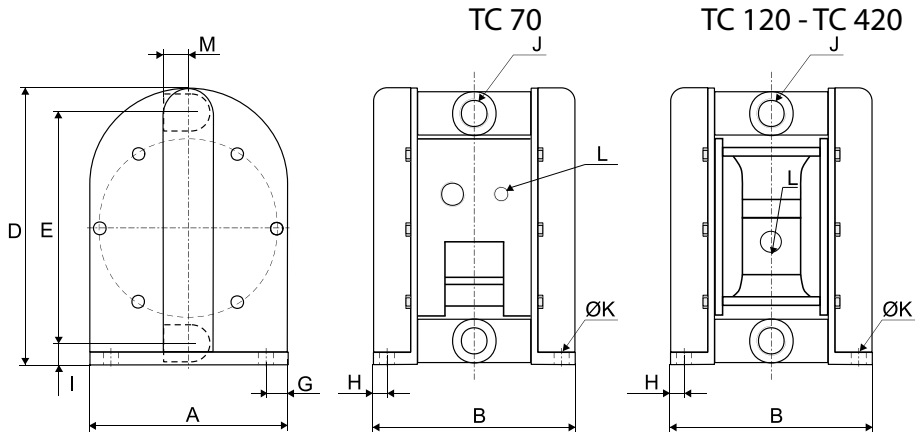
Data	Pump size			
	TC 50	TC 100	TC 200	TC 400
General characteristics				
*Max capacity (l/min) / (US gpm)	60 / 15.8	125 / 33	330 / 87	570 / 150
**Volume per stroke (ml) / (cu in)	87.5 / 5.34	280 / 17.1	933 / 56.9	2300 / 140.3
Max discharge pressure (bar) / (psi)	8 / 116	8 / 116	8 / 116	8 / 116
Max air 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.

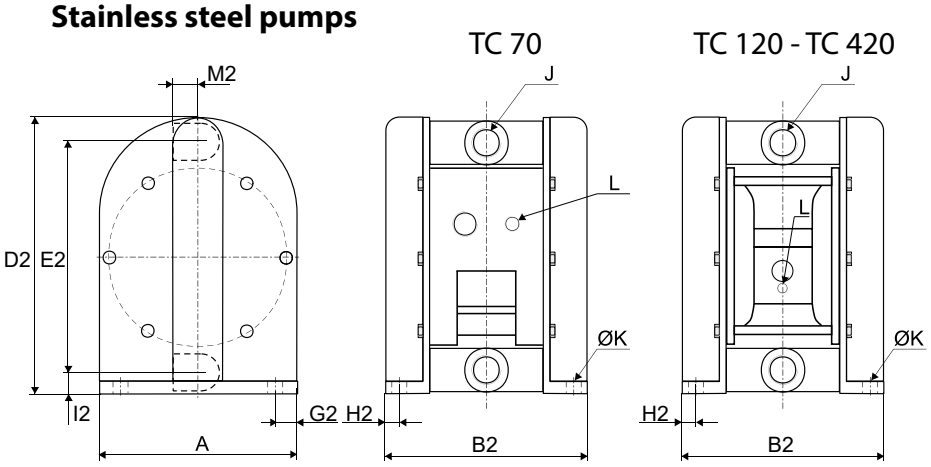
TC Metal pumps

Dimensions

Aluminium and cast iron pumps



Stainless steel 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

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

Technical data

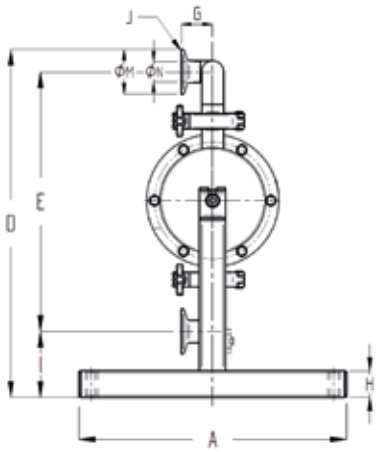
Data	Pump size			
	TC 70	TC 120	TC 220	TC 420
General characteristics				
*Max capacity (l/min) / (US gpm)	78 / 20	158 / 41	330 / 87	570 / 150
**Volume per stroke (ml) / (cu in)	87.5 / 5.34	420 / 25.6	933 / 56.9	2300/140.3
Max discharge pressure (bar) / (psi)	8 / 116			
Max air pressure (bar) / (psi)	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.

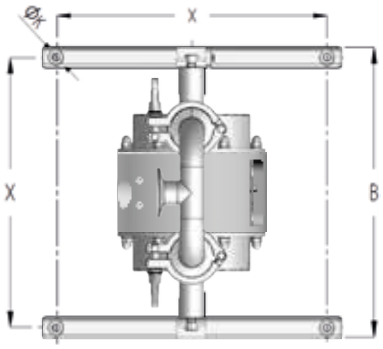
Dimensions & technical data

TC Sanitary pumps

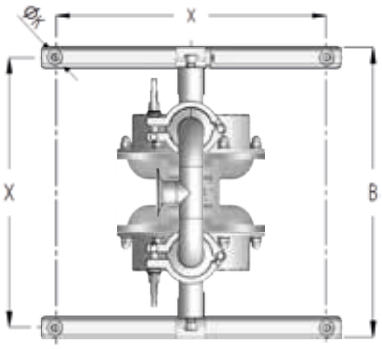
Dimensions



TC 80



TC 125 - TC 425



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"	2 1/2"
	DIN[2]	DN25	DN40	DN50	DN65
	SMS[3]	25	38	51	63.5
	RJT	1"	1 1/2"	2"	3"
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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