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# Turbo Molecular Pump

## STP-301/451 series

### Specification

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#### Pump Type

- STP-301
- STP-451
- STP-301C
- STP-451C

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## 1 Introduction

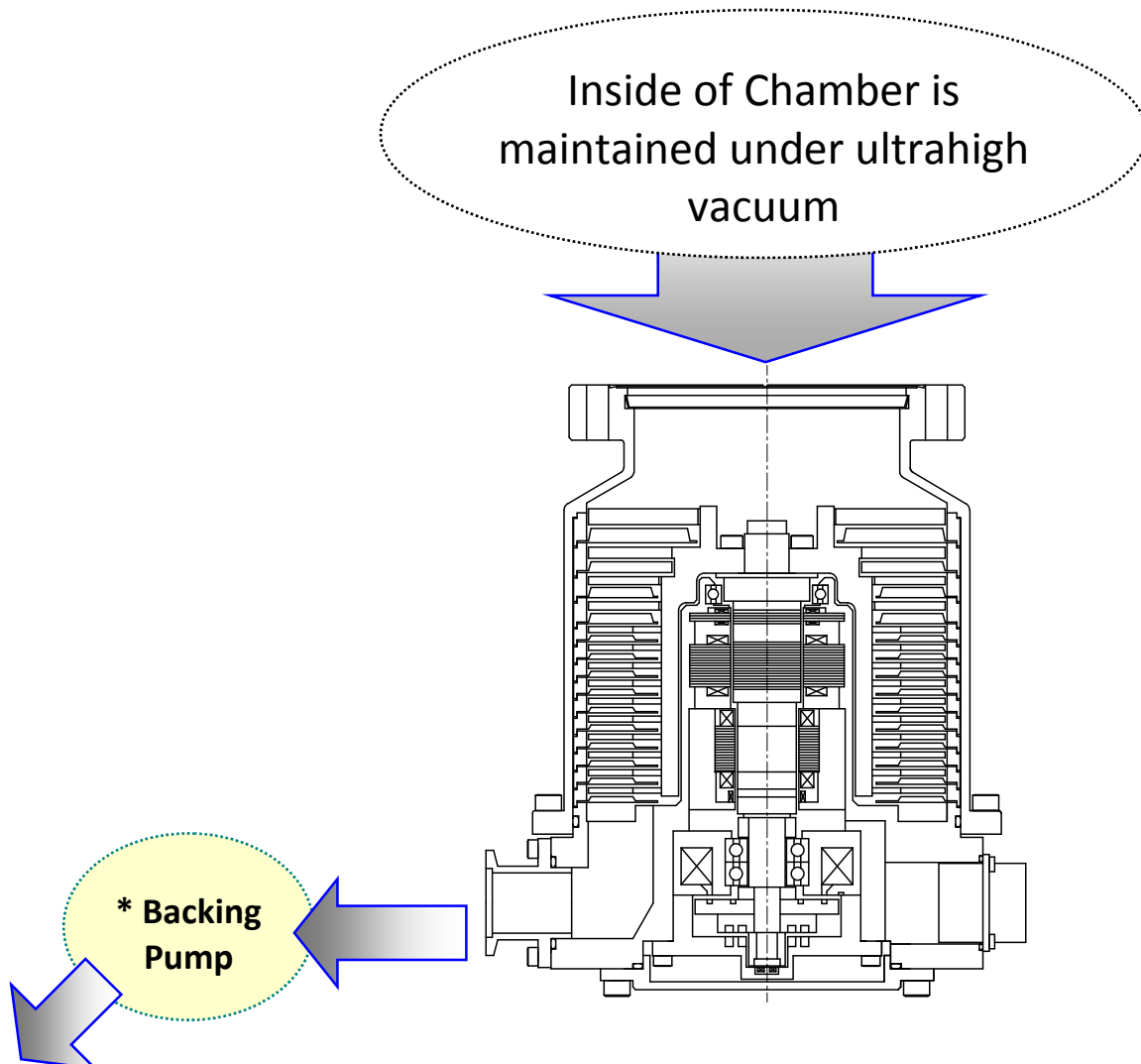
Turbo Molecular pump is one of the most important Vacuum Components in the most-advanced technology fields like Semiconductor and LCD manufacturing tools, high-energy physics, etc.

This document describes the standard specification for the magnetically levitated turbo molecular pumps of STP-301/451 and STP-301C/451C.

- STP-301/451 is one of UHV (Ultra-high vacuum) series turbomolecular pump and outfitted with all rotor blades to realize ultra-high vacuum.
- STP-301C/451C is corrosion resistant turbomolecular pump (C type), which has a capability against corrosive gases (chlorine or fluorine system gases) with anti-corrosion treatment.

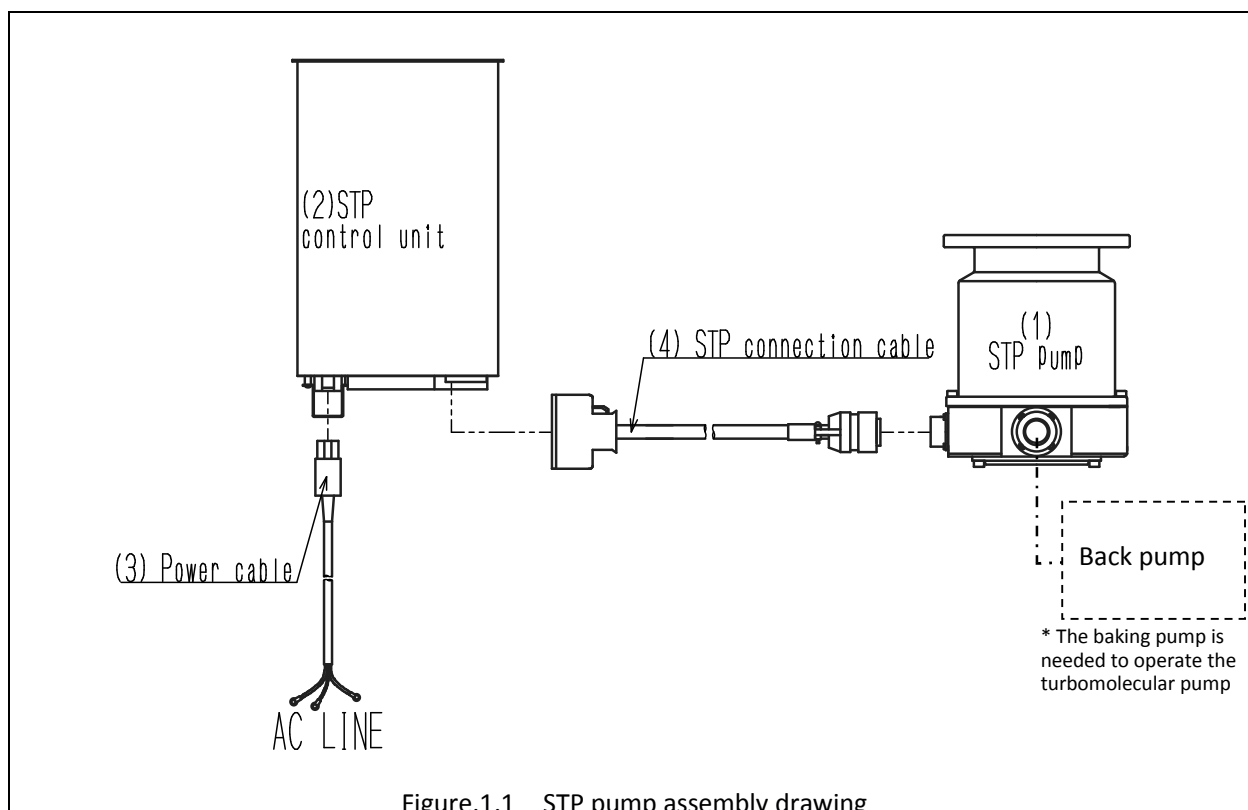
### 1.1 Application

- Electron beam microscope
- Surface analyzer
- Mass spectrum analyzer
- Accelerators
- Nuclear fusion experimental equipment
- Semiconductor / LCD manufacturing equipment (such as a dry etcher, CVD, sputter, and ion implanter)



\* The backing pump is needed to operate the turbomolecular pump.

## 1.2 Configuration



	Item	Q'ty	Description	Need to specify at order
(1)	STP pump	1	Select pump type and inlet flange type according to the customer specifications. See the chapter 2.1 for the pump specifications.	- Inlet flange type - Corrosion resistance
(2)	STP control unit	1	The control unit has a remote function to communicate with the customer tool. The controller accepts Start/Stop commands and delivers the pump operating status (Levitation, Normal, Alarm etc)	- Option
(3)	Power cable	1	Power cable to supply AC power to the controller. Specify the cable length to order. (3m/5m/10m/15m)	- Cable length
(4)	STP connection cable	1	The connection cable between STP pump and STP control unit. Straight type and L-type are available on the pump side connector. Specify the angle for the L-type connector to order. (0° / 270°) Specify the cable length to order. (3m/5m/10m/15m/20m)	- Connector type - Angle for L-type connector - Cable length

\* Use the STP selection sheet at the end of this document when ordering our pumps.

## 2 STP pump

### 2.1 STP pump specification

Pump Type		STP-301	STP-451	STP-301C	STP-451C
Corrosion resistant specific		N/A		Applicable	
Flange size	Inlet port flange	VG100 ISO100 ICF152	VG150 ISO160 ICF203	VG100 ISO100 ICF152	VG150 ISO160 ICF203
	Outlet port flange	KF25			
	Purge port flange	N/A		KF10	
Pumping speed* <sup>1</sup> (L/s) (See chapter 7.1)	N <sub>2</sub>	300	480	300	480
	H <sub>2</sub>	300	460	300	460
Compression ratio* <sup>1</sup>	N <sub>2</sub>	>10 <sup>8</sup>			
	H <sub>2</sub>	2×10 <sup>4</sup>			
Ultimate pressure* <sup>1, *2</sup>	Pa	6.5×10 <sup>-6</sup> (5×10 <sup>-8</sup> Torr): VG/ISO flange			
		10 <sup>-8</sup> (10 <sup>-10</sup> Torr) order: ICF flange		10 <sup>-7</sup> (10 <sup>-9</sup> Torr) order: ICF flange	
Allowable maximum working pressure* <sup>1</sup>	Pa	6.7×10 <sup>-2</sup> (5×10 <sup>-4</sup> Torr)			
Allowable maximum backing pressure* <sup>1</sup>	Pa	13 (0.1 Torr)			
Enable exhaust gas		STP-301/STP-451 is not corrosion resistant type. Chlorine and Fluorine gases cannot be used. Use corrosion resistant pump (C type) when using Chlorine and Fluorine gases.		Chlorine and Fluorine gases can be used. When using the following gas, contact Edwards. - The gas including alkali metal, but except "Li". - The gas including "Ga", "Hg", "Sn" and "In". - HBr	
Purge gas flow rate	Pa·m <sup>3</sup> /s (SCCM)	-		1.7×10 <sup>-2</sup> (10) (see chapter 2.2.2)	
Back pump size	L/min	> 240 (Recommended)			
Rated speed	rpm	48,000 (Allowable speed range: between 25,000 and 48,000)			
Starting time	min	3			
Stopping time	min	5			
Baking temperature	°C	<120			
Lubricating oil		Not Necessary			
Installation position		Free			
Cooling method		Natural Air Cooling (Air cooling: for baking / gas suction)			
Mass	kg	11	12	11	12
Physical size	mm	(See chapter 6.3 Pump Overview Chart)			
Ambient air temp. range	°C	0 to 40			
Storage temp. range	°C	-25 to 55			
Connection cable length	m	30 (maximum)			

The data inside above table are the typical measured value. It's not guaranteed performance.

\*<sup>1</sup> : Pumping speed, compression ratio, ultimate pressure, allowable maximum working pressure and allowable backing pressure are measured by Edwards method.

\*<sup>2</sup> : Ultimate pressure is a value after baking.

## 2.2 Precaution before installing the STP pump

### 2.2.1 How to secure the STP pump

The STP pump has a high-speed rotor. The worst-case failure may result in a jump in rotational torque leading to personal injury or equipment damages.

The generated torque during a pump failure is called "Destructive torque". Design and secure the mounting for the STP pump on the tools in order to withstand this destructive torque. Refer to Table 2.1 for destructive torque values and recommended bolts. All flange bolts size should be the size specified by the flange standard. And, it is necessary to use all flange holes in order to secure the STP pump mounting.

Table 2.1 Destructive torque and recommended bolts

Inlet flange is secured with bolts

Pump type		STP-301/451	
Flange type		VG100/VG150	ICF152/ICF203
Destructive torque [Nm]		3.8×10 <sup>3</sup>	3.8×10 <sup>3</sup>
Secured the base (8 positions)	Without damper	Although base securing is unnecessary, it is recommended for safety.	
	With damper	Secure the base or install torque restraint. The pump can be installed only vertically.	
Recommended bolts for flange	Shape of bolts	M10 Standard	M8 Standard
	Q'ty	8	16
	Steel type *1	Stainless steel	Stainless steel
	Strength class *1	70 or more	70 or more

Use all 8 leg-holes on the base plate or the 8 legs (optional accessory) to secure the pump.

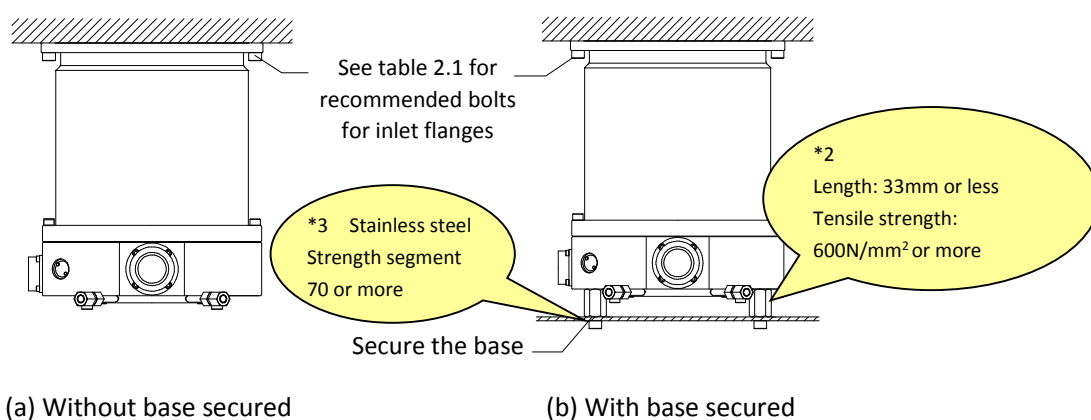


Figure 2.1 Methods of securing the STP pump using inlet flange holes

\*1 Refer to JISB1051(ISO898-1), JISB1054(ISO3506), AMS6419(Aerospace Material Specification).

\*2 The length of the legs, when the customer would like to make, should be 33mm or less. And the material tensile strength should be 600N/mm<sup>2</sup> or more.

\*3 The bolts for the base secure should be Stainless Steel with strength segment of 70 or more.

Table 2.1 Table Destructive torque and claw clamps

Pump type		STP-301/451
Flange type		ISO100/ISO160
Destructive torque [Nm]		$3.8 \times 10^3$
Secured the base (8 positions)	Without damper	Secure the base
	With damper	Secure the base or install torque restraint. The pump can be installed only vertically.
Flange Claw clamp	Number of claw clamps	4 or more
	Clamper position	Position the claw clamps evenly on the circumference

Inlet flange is secured with claw clamps

Use all 8 leg-holes on the base plate or the 8 legs (optional accessory) to secure the pump.

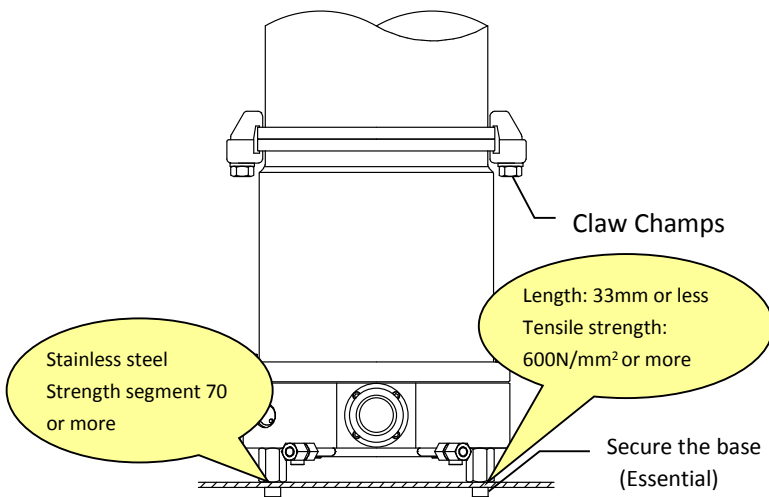


Figure 2.2 Example of securing the STP pump  
(When securing the inlet port flange with claw clamps)

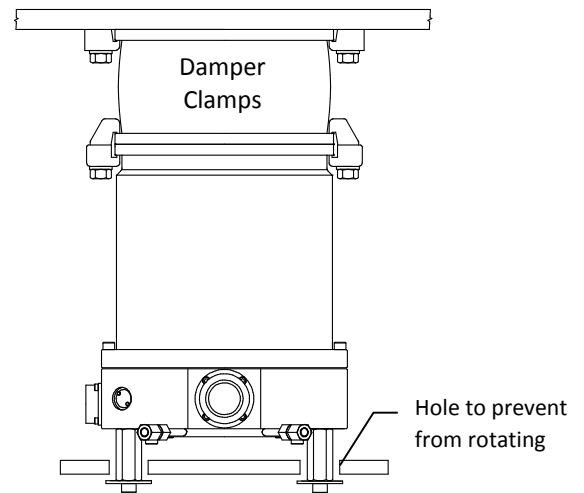


Figure 2.3 Example of securing the STP pump  
(When installing the damper in the inlet port flange)

## 2.2.2 Purge gas for STP pump (only STP-301C/451C)

When pumping reactive or corrosive gases, introduce the dry N<sub>2</sub> gas or other gas in to the STP pump in order to protect the inside of the STP pump.

- ◇ Introduce dry N<sub>2</sub> or other gas into the pump through the purge port using the electromagnetic valve or the needle valve provided by the customer.
- ◇ Recommended purge gas flow rate is  $1.7 \times 10^{-2} \text{ Pa} \cdot \text{m}^3/\text{s}$  (10 sccm).
- ◇ The allowable gas pressure ranges from  $1.0 \times 10^5 \text{ Pa}$  [atmospheric pressure] to  $4.9 \times 10^4 \text{ Pa}$  [0.5 kgf/cm<sup>2</sup>] on the introduction side.
- ◇ It is possible to have some noise from the STP pump when the inlet pressure becomes higher. But there is no problem to use the STP pumps as normal.

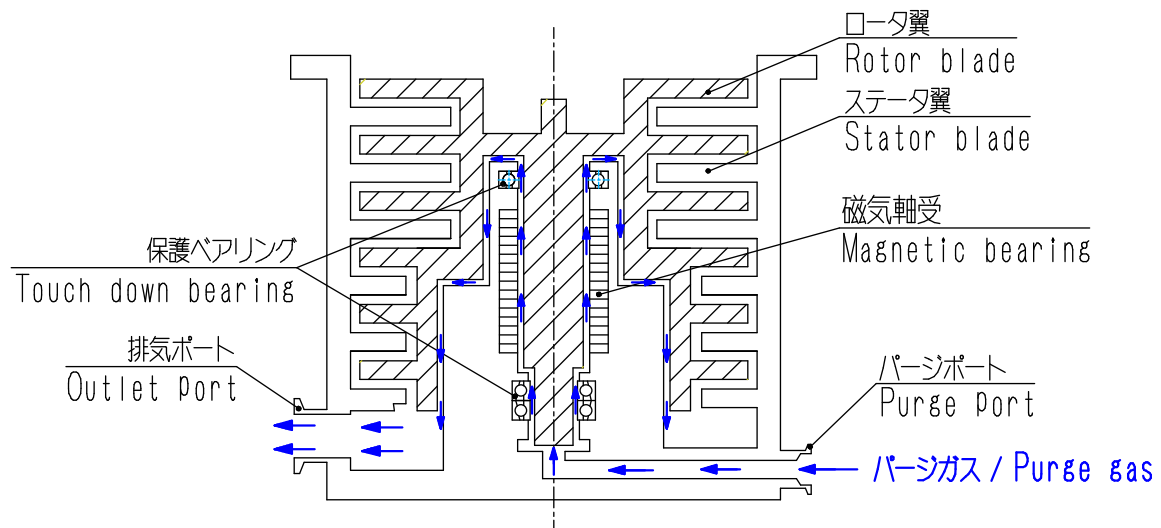


Figure 2.4 Purge gas flow inside the pump



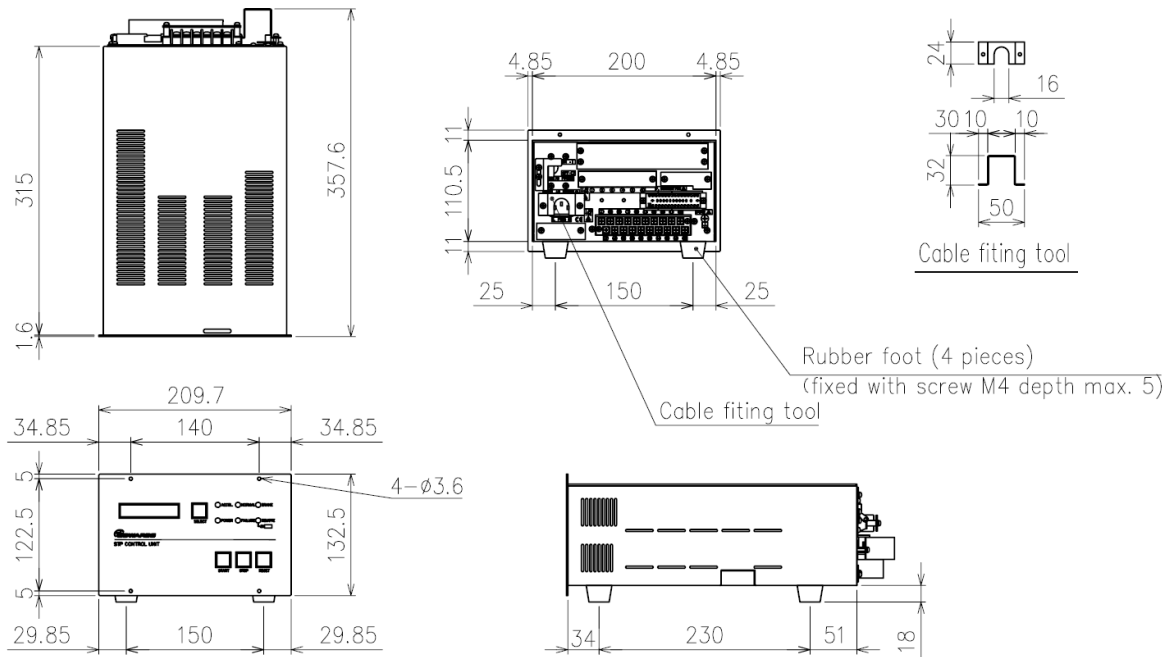
### 3 STP control unit specification

Type	Specification
SCU-350	Standard
SCU-350A	With ABS*1 function
SCU-350H	With STP-200/300/400 series compatible remote input / output connector (CON4)
SCU-350HA	With STP-200/300/400 series compatible remote input / output connector (CON4) With ABS*1 function

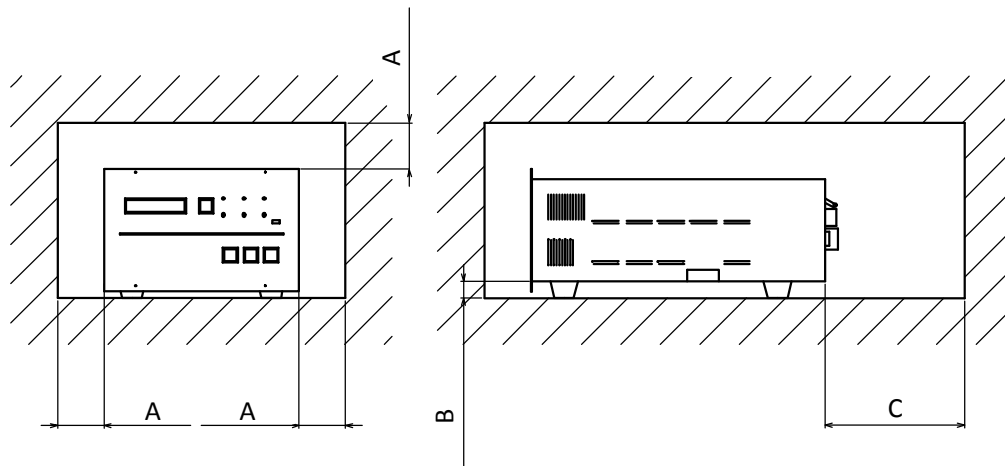
Item		Specification
Input voltage	Vac	100 to 240
Input frequency	Hz	50/60+/-2
Input phase		Single phase
Input power (Maximum value)	VA	350
Leakage current	mA	3.5 or less
Main breaker rated current	A	5
Main breaker ampere interrupting capacity	A	1000 (240Vac: 50/60Hz)
Allowable operating temperature	°C	0 to 40
Allowable storage temperature	°C	-25 to 55
Mass	kg	8
Remote interface		I/O Remote (see Section 7)

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\*1 ABS: Automatic Balancing System. The vibration reduction function of the STP pump.



External view of STP control unit

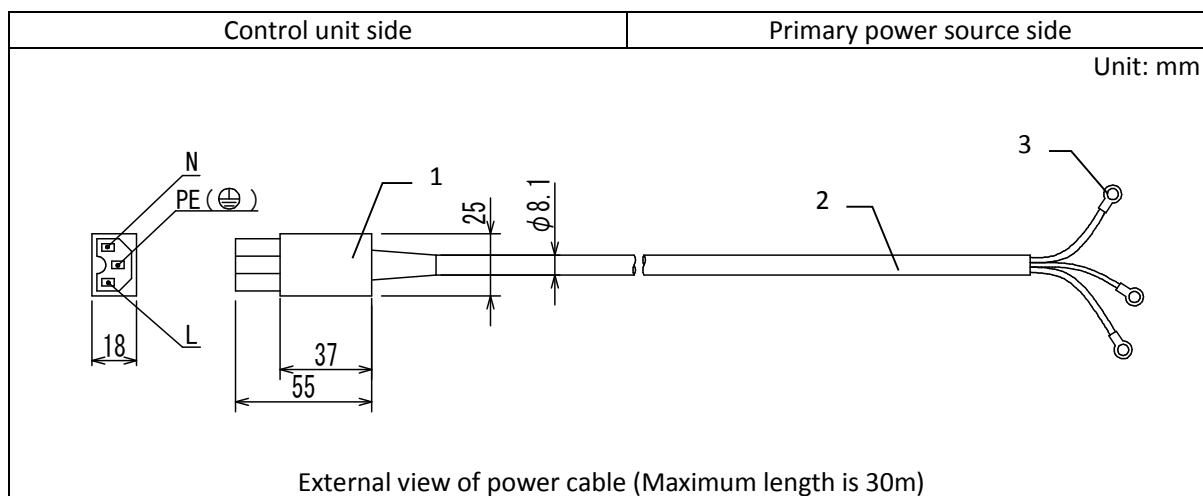


- A. 50 mm (1.97") or more      B. 18 mm (0.71") or more      C. 246 mm (9.69") or more

Installing STP control unit

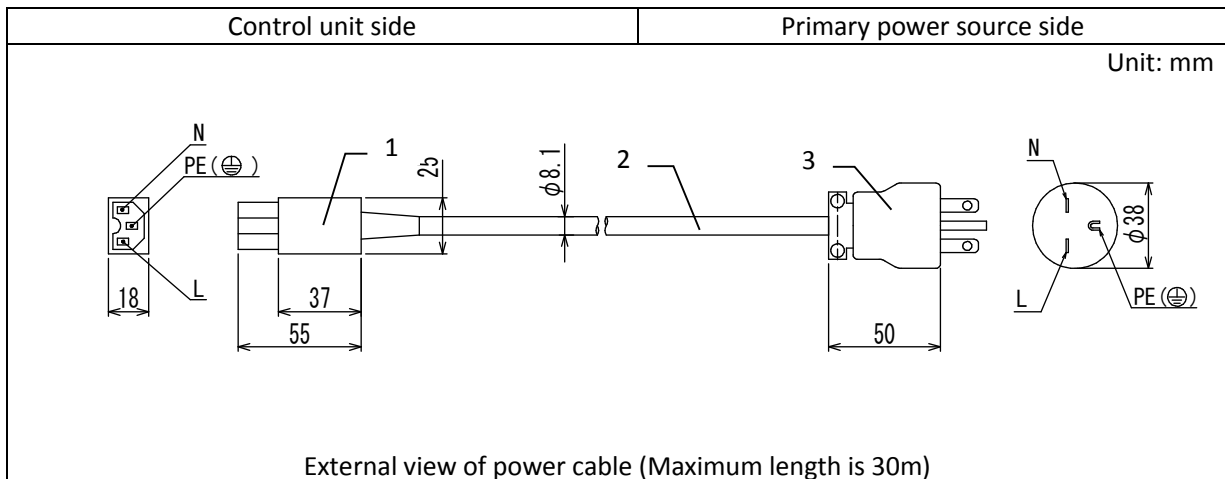
## 4 Power cable specification

### 4.1 Power cable (without plug)

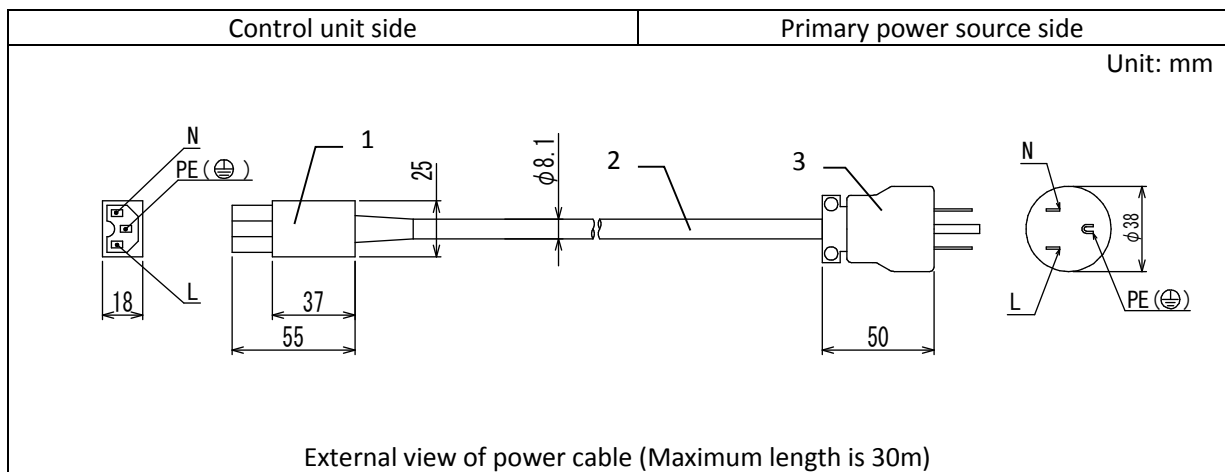


- 1 3 pin (socket)
- 2 1.5 mm<sup>2</sup> × 3 cores,  $\phi$ 8.1 mm  
Cable color : Black1, Black2, Yellow/Green
- 3 Crimp-type terminal (M4)

## 4.2 Power cable (with plug)



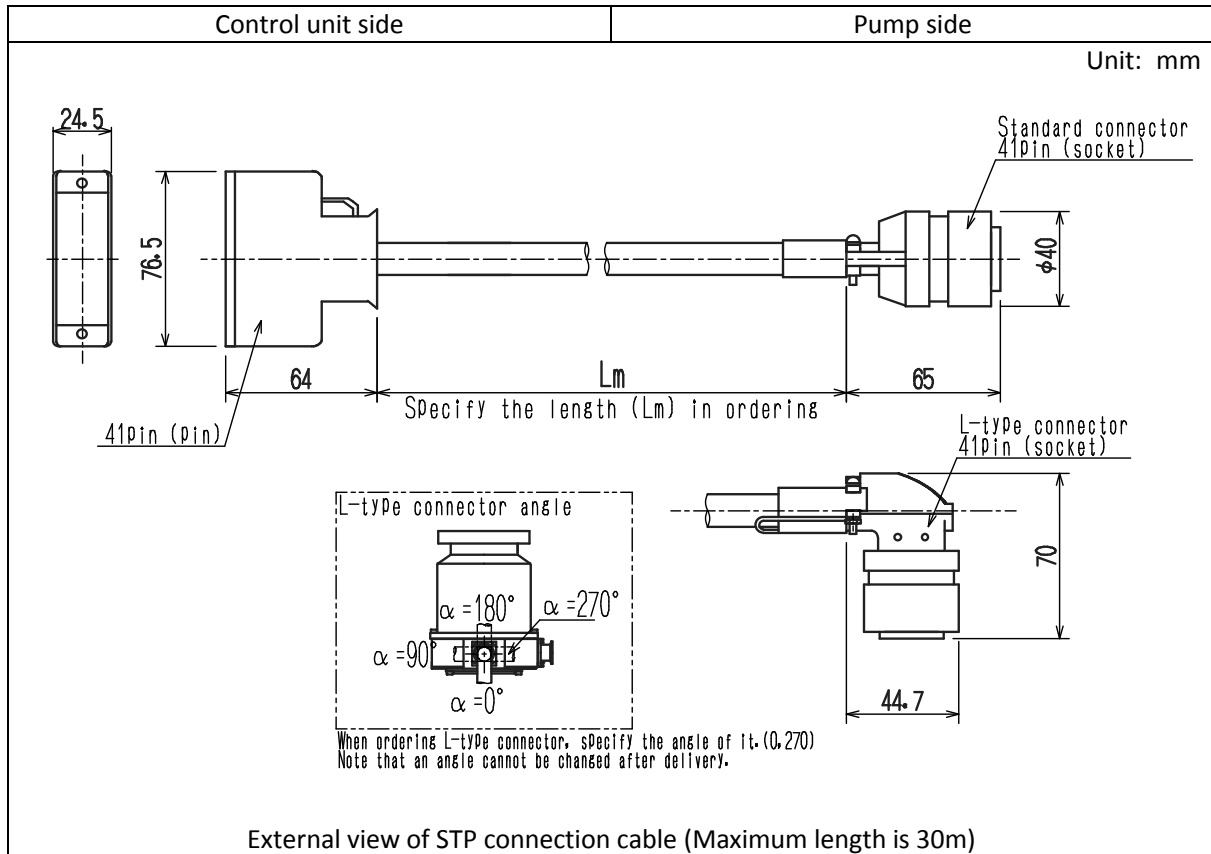
Plug type NEMA 5-15



Plug type NEMA 6-15

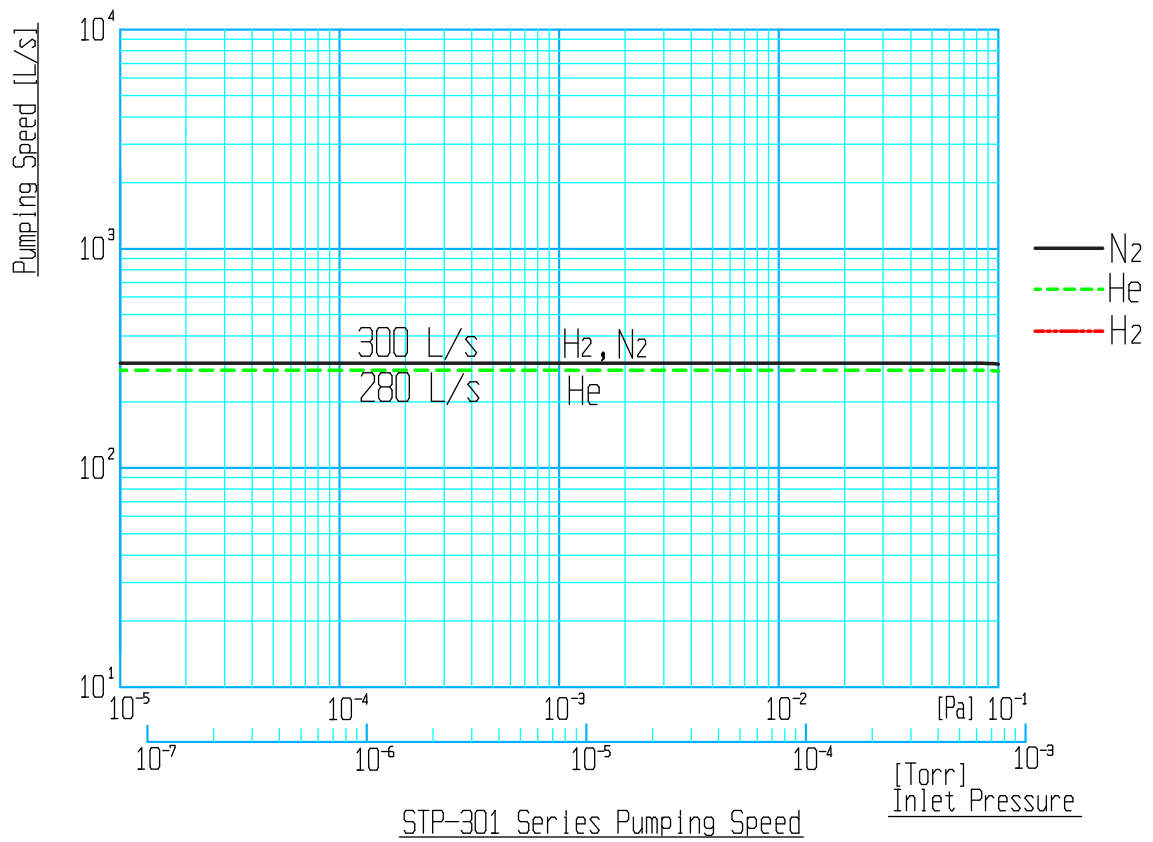
- 1 3 pin (socket)
- 2 1.5 mm<sup>2</sup> × 3 cores,  $\phi$ 8.1 mm  
Cable color : Black1, Black2, Yellow/Green
- 3 Crimp-type terminal (M4)

## 5 STP connection cable specification

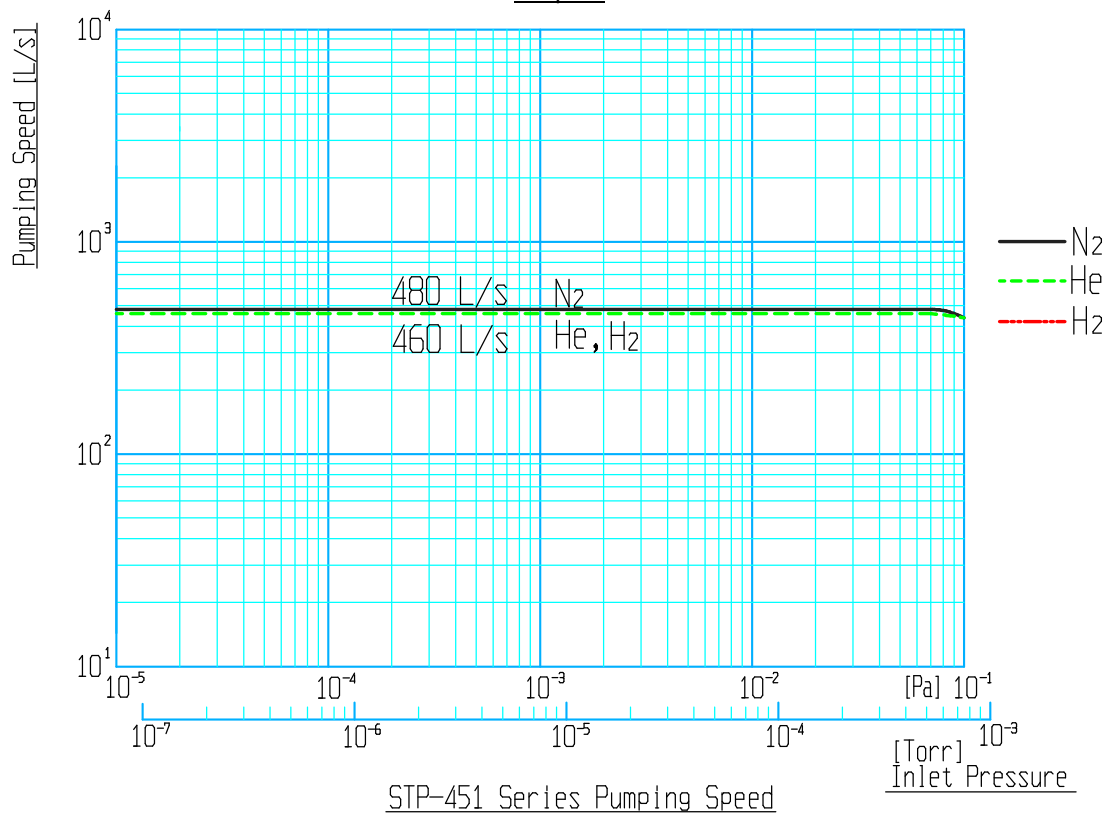


## 6 STP pump detailed specification

### 6.1 Pumping speed graph

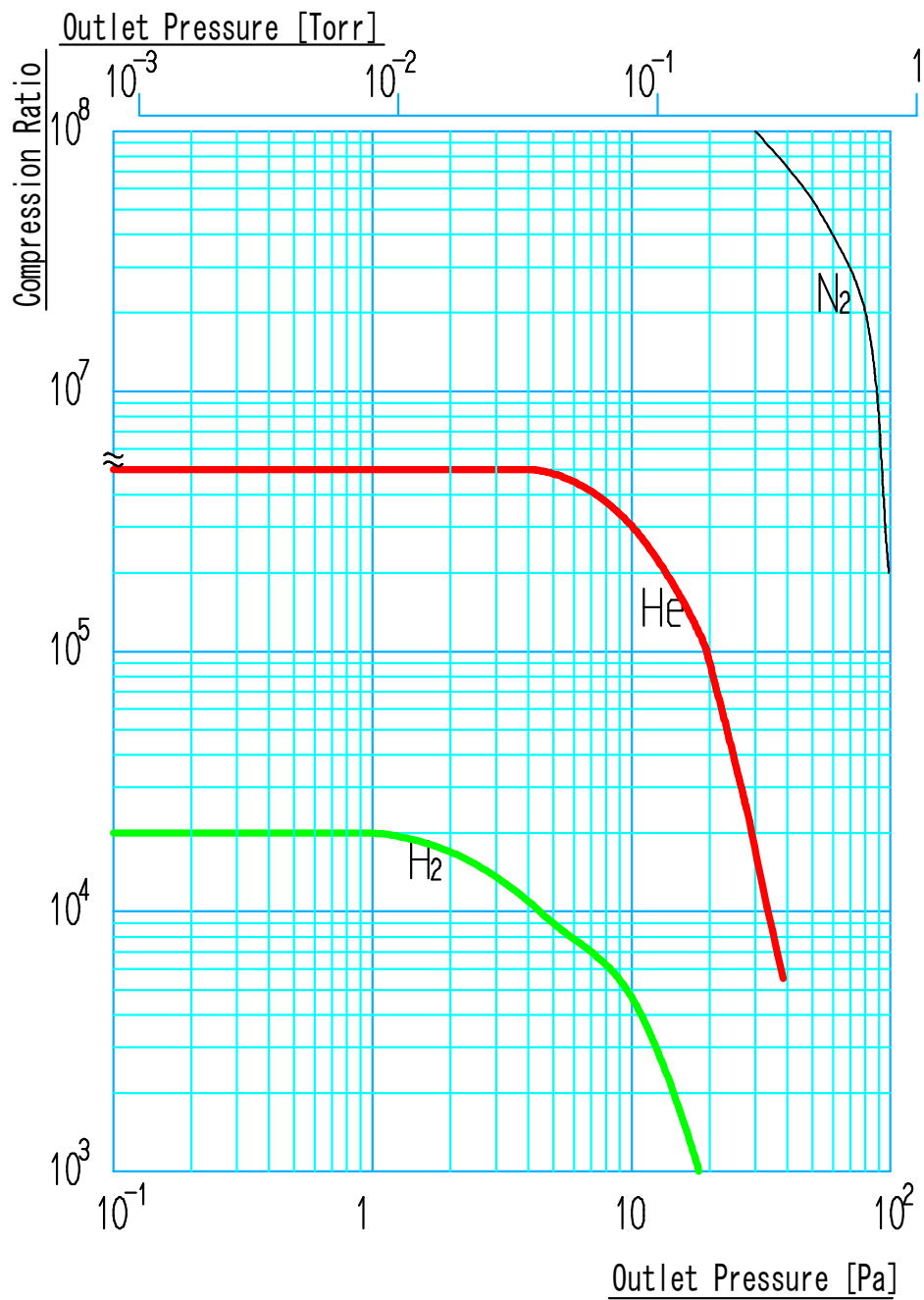


**Graph 1**



**Graph 2**

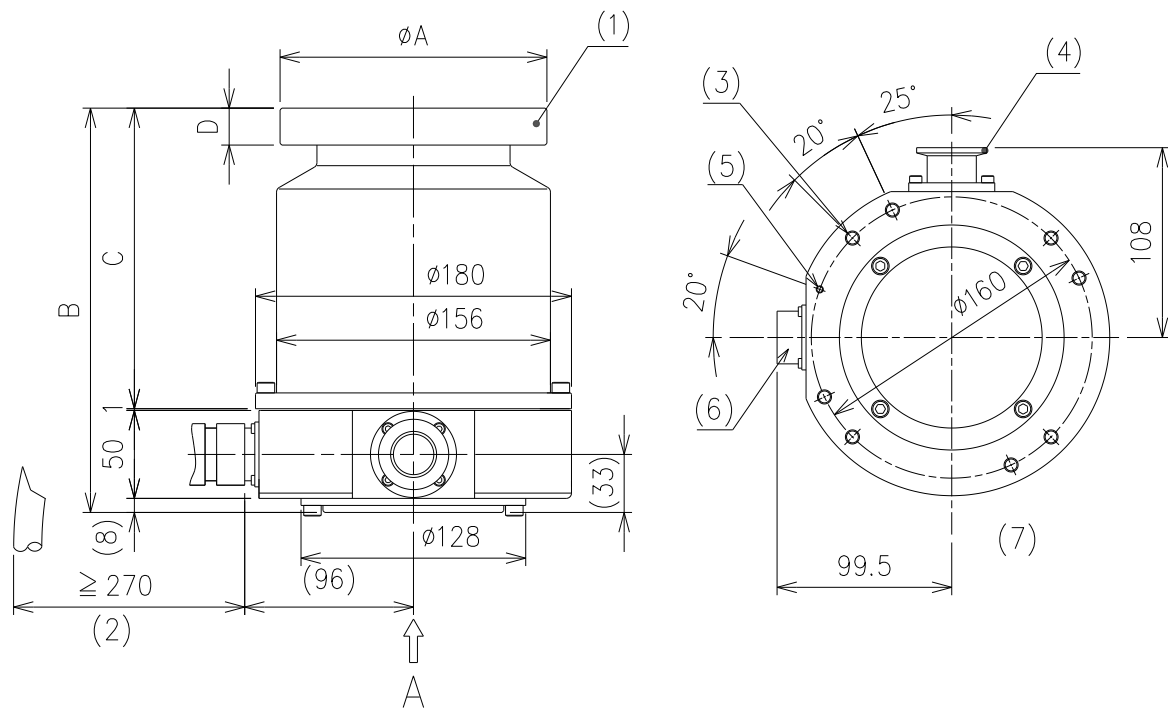
6.2 Compression ratio graph



STP-301/451series Compression Ratio

Graph 3

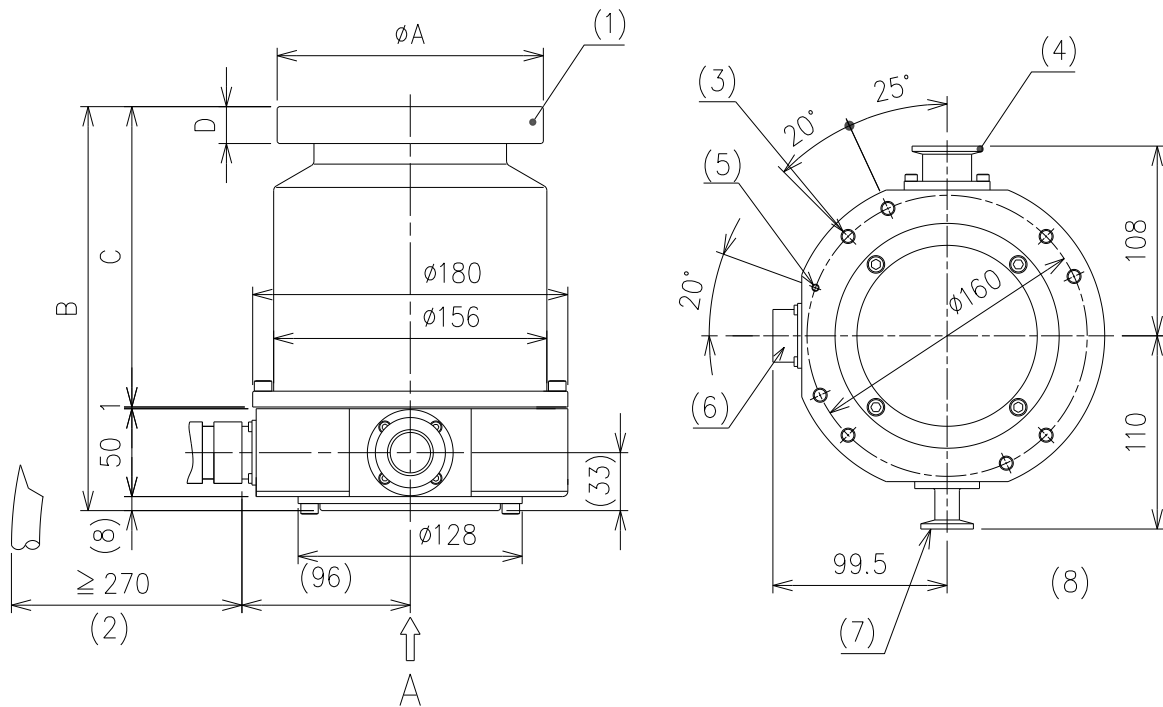
### 6.3 STP pump external views



**STP-301/451 series (Non-corrosion resistant type)**

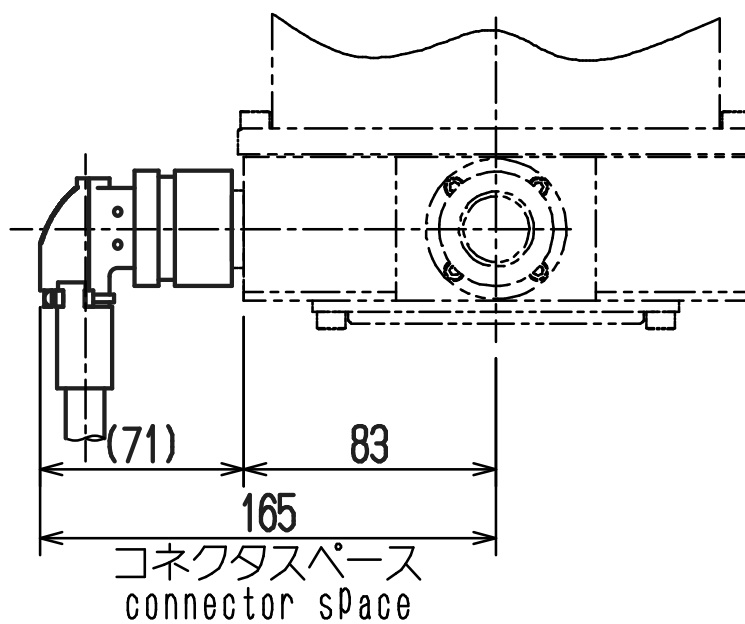
No.	Item	Description	STP-301 series			STP-451 series			
			ICF152	VG100	ISO100	ICF203	VG150	ISO160	
1	Inlet port flange		øA	152	185	130	203	235	180
2	Bending dimension of the STP connection cable		B	230	230	230	200	200	200
			C	171	171	171	141	141	141
			D	21	12	12	22	12	12
3	Screw hole of legs	8-M8 depth 16							
4	Outlet port flange	KF25							
5	Screw hole for earth	M4							
6	STP connector								
7	Viewed from arrow A								





STP-301/451 series (Corrosion resistant type)

No.	Item	Description	STP-301 series			STP-451 series			
			ICF152	VG100	ISO100	ICF203	VG150	ISO160	
1	Inlet port flange		$\phi A$	152	185	130	203	235	180
2	Bending dimension of the STP connection cable		B	230	230	230	200	200	200
			C	171	171	171	141	141	141
			D	21	12	12	22	12	12
3	Screw hole of legs	8-M8 depth 16							
4	Outlet port flange	KF25							
5	Screw hole for earth	M4							
6	STP connector								
7	Purge port	KF10							
8	Viewed from arrow A								



STP-301/451 connector space (L-type connector)

## 7 Remote input/output signal specifications \*1

### 7.1 I/O TB1 terminal

Pin No	Description	Pin No	Description
1	AC POWER IN (for FAN)	11	ALARM OUT (N.C)
2	AC POWER IN (for FAN)	12	BRAKE OUT (N.O)
3	FAN OUT*2 (AC power out for FAN)	13	NORM OUT (N.O)
4	FAN OUT (AC power out for FAN)	14	BRAKE OUT (N.O)
5		15	NORM OUT (N.C)
6		16	NORM OUT (COM)
7	POWER OUT (N.O)	17	ACC OUT (N.O)
8	POWER OUT (N.O)	18	ACC OUT (N.O)
9	ALARM OUT (N.O)	19	REMOTE OUT (N.O)
10	ALARM OUT (COM)	20	REMOTE OUT (N.O)

IN: Input pin, OUT: Output pin,  
N.O\*3: Normal Open, N.C\*4: Normal Close, COM: Common  
Output signal specification: Contact point ratings  
(Rated load: ALARM, NORM OUT 250Vac/8A, 30Vdc/8A (Resistance load))  
(Rated load: Another signal 250Vac/10A, 30Vdc/10A (Resistance load))  
Terminal screw size: M3.5

### 7.2 I/O TB2 terminal

Pin No	Remarks
1	12Vdc OUT (for remote signal)
2	0Vdc OUT (for remote signal)
3	COMMON IN
4	STOP IN
5	START IN
6	RESET OUT

IN: Input pin, OUT: Output pin,  
Input signal specification: COMMON IN – Input 12Vdc to 48Vdc/25Vac between input pins.  
Terminal screw size: M4

\*1: Refer to the Instruction Manual for the detail explanations.

It is recommended to use a remote cable with shield type, and connect both terminals to ground.

\*2: Voltage input into "AC POWER IN (for FAN) [1Pin-2Pin]" is output.

\*3: N.O; The contact will close when the STP pump status becomes the stated status.

\*4: N.C; The contact will open when the STP pump status becomes the stated status.

### 7.3 Connector CON4

The CON4 connector (optional accessory) and TB2 terminal (standard) which are compatible with STP-301H are installed on the rear panel. Set the the DSW-B dipswitch on the top panel to No.4 to select the one of remote input/output signal terminals.

The CON 4 connector (optional accessory) is set to enable (DSW-B No.4 is "ON") at delivery.

Pin No	Description	Pin No	Description
1		13	
2	RESET IN (24VDC IN) (Corresponds to the POWER OFF signal input terminals of the STP-300)	14	RESET IN (0VDC IN) (Corresponds to the POWER OFF signal input terminals of the STP-300)
3	START IN (24VDC IN)	15	START IN (0VDC IN)
4	STOP IN (24VDC IN)	16	STOP IN (0VDC IN)
5	REMOTE OUT (N.O)	17	REMOTE OUT (N.O)
6	ROTATION OUT (N.O)	18	ROTATION OUT (N.O)
7	EMERGENCY OPERATION OUT (N.O)	19	EMERGENCY OPERATION OUT (N.O)
8	FAILURE OUT (N.O)	20	FAILURE OUT (N.O)
9	OVER TEMPERATURE OUT (N.O)	21	OVER TEMPERATURE OUT (N.O)
10		22	
11	ACCELERATION OUT (N.O) / NORMAL OPERATION OUT (N.O)	23	ACCELERATION OUT (N.O)
12		24	NORMAL OPERATION OUT (N.O)

IN: Input pin, OUT: Output pin, N.O<sup>\*2</sup>: Normal Open,  
 Input signal specification: Input 24 VDC (3 seconds or more) between each input pins.  
 Output signal specification: Contact point ratings (125VAC/0.4A, 30VDC/2A [Resistance load])  
 Connector type: 57LE-20240-2700D35 (DDK) [GP-IB<sup>\*3</sup> 24Pin]  
 Procure the remote connector at your company.

### 7.4 Recommended service parts

Product name	Model	Specification
Fuse for F1 and F2	MF60-NR10 (10 A/250 V) (Toyo Fuse)	10 A, 250 V, normal acting fuse φ6.35×30 mm

\*1: Refer to the Instruction Manual for details on how to use.

\*2: N.O: The contact will close when the STP pump status becomes the stated status.

\*3: General Purpose - Inter face Bus (conform to IEEE-STD-488-1978 standard)

## 8 Attachment components

Below parts are attached with the pump as standard.

Item	Q'ty	Note
Blank flange for purge port (KF10)	1	They are supplied to the corrosion resistance pump (type C)
Clamper for purge port (KF10)	1	
O-ring for the purge port (KF10)	1	
Instruction Manual	1	

## 9 Accessory

The following accessories are prepared according to the use.

Item	Remark
Air-cooling unit	Pump cooling (when pumping gas or baking)
Damper	It reduces the vibration from the pump to the equipment

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# Turbo Molecular Pump

## STP-301/451 series Selection Guide

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### Pump Type

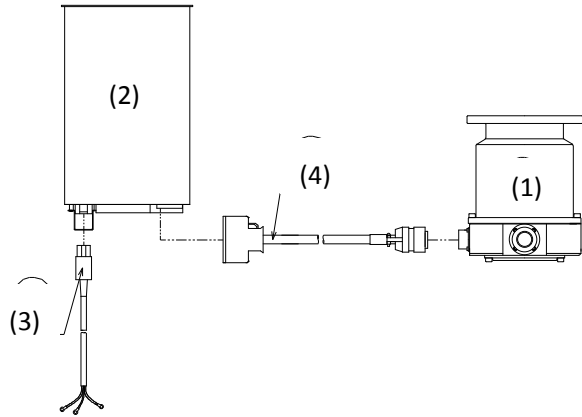
- STP-301
- STP-451
- STP-301C
- STP-451C

# STP-301/451 series Selection Guide

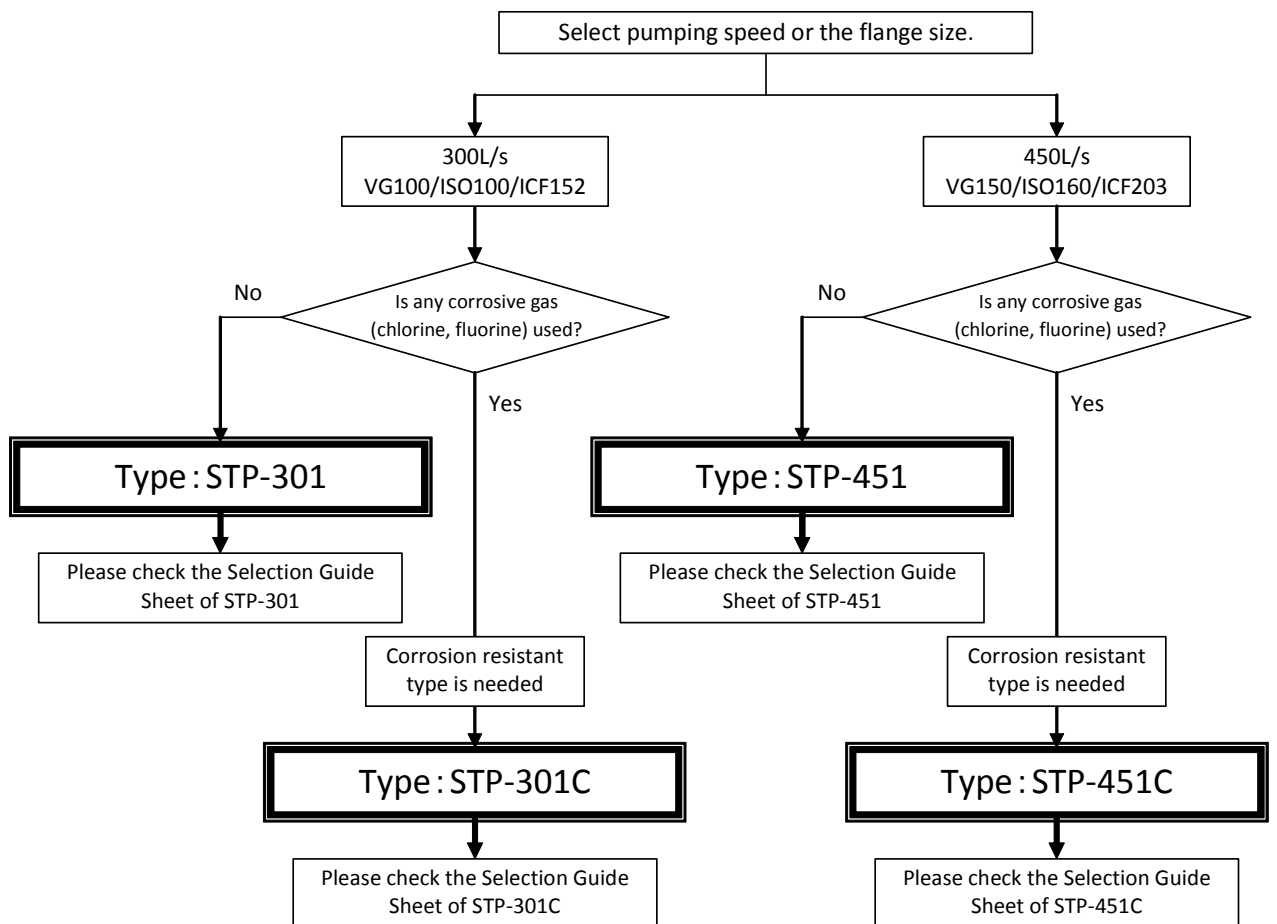
Please complete a kit using the Product Structure and the Selection Flow Chart.

## < Product Structure >

	Item	Q'ty
(1)	STP pump	1
(2)	STP control unit	1
(3)	Power cable	1
(4)	STP connection cable	1

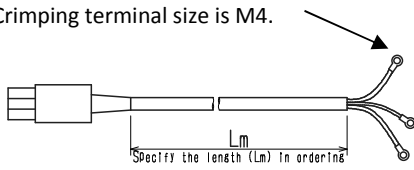
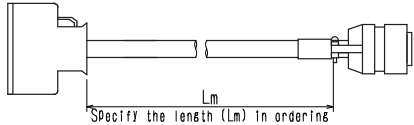
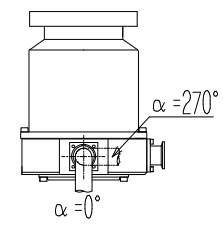


## < Selection Flow Chart >



### STP-301 Selection Guide Sheet

Please tick the boxes to order the components.

<input checked="" type="checkbox"/> Pump type : STP-301		Item	Part number	Select	Note	
(1) STP pump	VG100	YT21B0190	<input type="checkbox"/>	Select flange size. Outlet port: KF25 Purge port: N/A		
	ISO100	YT21B0350	<input type="checkbox"/>			
	ICF152	YT21B0010	<input type="checkbox"/>			
(2) STP control unit Type : SCU-350 Input voltage 100Vac to 240Vac	Please select option.					
	SCU-350	YT21Z0Z01	<input type="checkbox"/>	Standard		
	SCU-350	YT21ZEZ20	<input type="checkbox"/>	With RS232C		
	SCU-350A	YT21ZCZ00	<input type="checkbox"/>	With ABS* <sup>1</sup> function		
	SCU-350A	YT21ZФЗ00	<input type="checkbox"/>	ABS function, RS232C		
	SCU-350H	YT21Z4Z00	<input type="checkbox"/>	With STP-200/300/400 series compatible remote input / output connector (CON4)		
(3) Power cable *	Please select cable length.					
	3m	B70700090	<input type="checkbox"/>	Crimping terminal size is M4. 		
	5m	B70700040	<input type="checkbox"/>			
	10m	PT21Y0A00	<input type="checkbox"/>			
	15m	PT21Y0A01	<input type="checkbox"/>			
Please select connector type and cable length.						
Both side straight connector	3m	B70700010	<input type="checkbox"/>			
	5m	B70700000	<input type="checkbox"/>			
	10m	B70700130	<input type="checkbox"/>			
	15m	B70700070	<input type="checkbox"/>			
	20m	B70700150	<input type="checkbox"/>			
- Pump side L-type connector ( $\alpha=0^\circ$ ) - Controller side straight	3m	PT21Y3B00	<input type="checkbox"/>	Need to select angle for L-type connector. 		
	5m	PT21Y3B01	<input type="checkbox"/>			
- Pump side L-type connector ( $\alpha=270^\circ$ ) - Controller side straight	3m	B70700240	<input type="checkbox"/>			
	5m	B70700110	<input type="checkbox"/>			
	10m	PT21Y3B05	<input type="checkbox"/>			
	15m	B70700140	<input type="checkbox"/>			
20m	B70700100	<input type="checkbox"/>				
Instruction Manual					<input checked="" type="checkbox"/>	CD

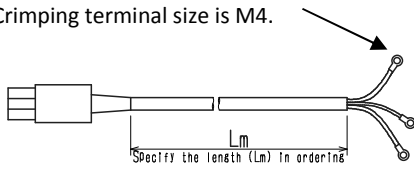
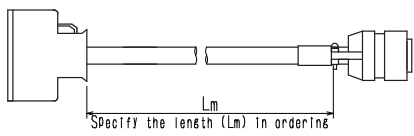
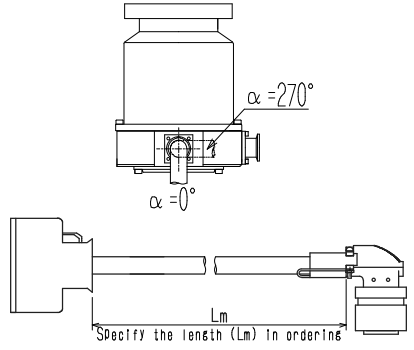
\* Maximum length of all cables is 30 m.

\*<sup>1</sup> ABS: Automatic Balancing System. The vibration reduction function of the STP pump.



## STP-451 Selection Guide Sheet

Please tick the boxes to order the components.

	Item	Part number	Select	Note	
(1) STP pump	VG150	YT210Z000	<input type="checkbox"/>	Select flange size. Outlet port: KF25 Purge port: N/A	
	ISO160	YT21B0460	<input type="checkbox"/>		
	ICF203	YT21B0080	<input type="checkbox"/>		
(2) STP control unit Type : SCU-350 Input voltage 100Vac to 240Vac	Please select option.				
	SCU-350	YT21Z0Z01	<input type="checkbox"/>	Standard	
	SCU-350	YT21ZEZ20	<input type="checkbox"/>	With RS232C	
	SCU-350A	YT21ZCZ00	<input type="checkbox"/>	With ABS* <sup>1</sup> function	
	SCU-350A	YT21ZФЗ00	<input type="checkbox"/>	ABS function, RS232C	
	SCU-350H	YT21Z4Z00	<input type="checkbox"/>	With STP-200/300/400 series compatible remote input / output connector (CON4)	
	SCU-350HA	YT21ZDZ00	<input type="checkbox"/>	With STP-200/300/400 series compatible remote input / output connector (CON4), with ABS* <sup>1</sup> function	
(3) Power cable *	Please select cable length.				
	3m	B70700090	<input type="checkbox"/>	Crimping terminal size is M4. 	
	5m	B70700040	<input type="checkbox"/>		
	10m	PT21Y0A00	<input type="checkbox"/>		
	15m	PT21Y0A01	<input type="checkbox"/>		
(4) STP connection cable *	Please select connector type and cable length.				
	Both side straight connector	3m	B70700010	<input type="checkbox"/>	
		5m	B70700000	<input type="checkbox"/>	
		10m	B70700130	<input type="checkbox"/>	
		15m	B70700070	<input type="checkbox"/>	
		20m	B70700150	<input type="checkbox"/>	
	- Pump side L-type connector ( $\alpha=0^\circ$ ) - Controller side straight	3m	PT21Y3B00	<input type="checkbox"/>	Need to select angle for L-type connector. 
		5m	PT21Y3B01	<input type="checkbox"/>	
	- Pump side L-type connector ( $\alpha=270^\circ$ ) - Controller side straight	3m	B70700240	<input type="checkbox"/>	
		5m	B70700110	<input type="checkbox"/>	
		10m	PT21Y3B05	<input type="checkbox"/>	
		15m	B70700140	<input type="checkbox"/>	
		20m	B70700100	<input type="checkbox"/>	
Instruction Manual			✓	CD	

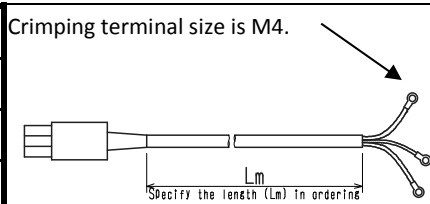
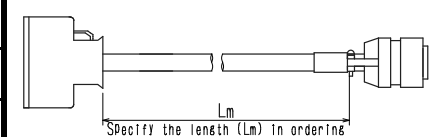
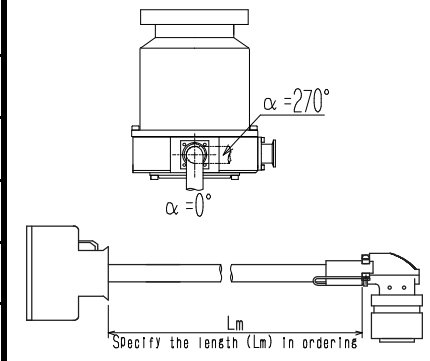
\* Maximum length of all cables is 30 m.

\*<sup>1</sup> ABS: Automatic Balancing System. The vibration reduction function of the STP pump.

### STP-301C Selection Guide Sheet

Please tick the boxes to order the components.

Pump type : STP-301C (Corrosion resistant type)

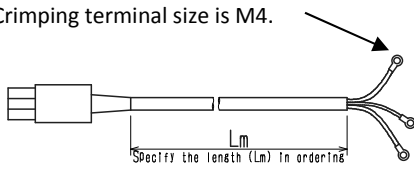
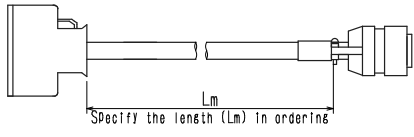
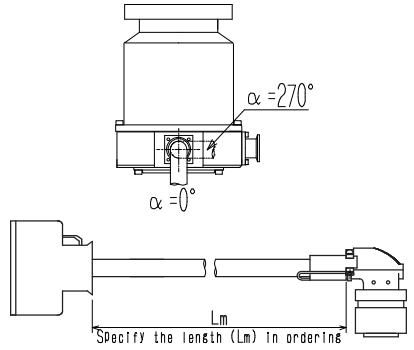
Item		Part number	Select	Note	
(1) STP pump	VG100	YT21AZ000	<input type="checkbox"/>	Select flange size. Outlet port: KF25 Purge port: KF10	
	ISO100	YT21B0660	<input type="checkbox"/>		
	ICF152	YT21B0630	<input type="checkbox"/>		
(2) STP control unit Type : SCU-350 Input voltage 100Vac to 240Vac	Please select option.				
	SCU-350	YT21Z0Z01	<input type="checkbox"/>	Standard	
	SCU-350	YT21ZEZ20	<input type="checkbox"/>	With RS232C	
	SCU-350A	YT21ZCZ00	<input type="checkbox"/>	With ABS* <sup>1</sup> function	
	SCU-350A	YT21ZФЗ00	<input type="checkbox"/>	ABS function, RS232C	
	SCU-350H	YT21Z4Z00	<input type="checkbox"/>	With STP-200/300/400 series compatible remote input / output connector (CON4)	
(3) Power cable *	Please select cable length.				
	3m	B70700090	<input type="checkbox"/>	Crimping terminal size is M4. 	
	5m	B70700040	<input type="checkbox"/>		
	10m	PT21Y0A00	<input type="checkbox"/>		
	15m	PT21Y0A01	<input type="checkbox"/>		
	25m	PT21Y0A02	<input type="checkbox"/>		
(4) STP connection cable *	Please select connector type and cable length.				
	Both side straight connector	3m	B70700010	<input type="checkbox"/>	
		5m	B70700000	<input type="checkbox"/>	
		10m	B70700130	<input type="checkbox"/>	
		15m	B70700070	<input type="checkbox"/>	
		20m	B70700150	<input type="checkbox"/>	
	-Pump side L-type connector (α=0°) - Controller side straight	3m	PT21Y3B00	<input type="checkbox"/>	Need to select angle for L-type connector. 
		5m	PT21Y3B01	<input type="checkbox"/>	
	-Pump side L-type connector (α=270°) -Controller side straight	3m	B70700240	<input type="checkbox"/>	
		5m	B70700110	<input type="checkbox"/>	
		10m	PT21Y3B05	<input type="checkbox"/>	
		15m	B70700140	<input type="checkbox"/>	
		20m	B70700100	<input type="checkbox"/>	
	Instruction Manual			<input checked="" type="checkbox"/>	

\* Maximum length of all cables is 30 m.

\*<sup>1</sup> ABS: Automatic Balancing System. The vibration reduction function of the STP pump.

## STP-451C Selection Guide Sheet

Please tick the boxes to order the components.

	Item	Part number	Select	Note	
<input checked="" type="checkbox"/> Pump type: STP-451C (Corrosion resistant type)					
(1) STP pump	VG150	PT21AZ001	<input type="checkbox"/>	Select flange size. Outlet port: KF25 Purge port: KF10	
	ISO160	YT21B0790	<input type="checkbox"/>		
	ICF203	YT21B0880	<input type="checkbox"/>		
	Please select option.				
(2) STP control unit Type : SCU-350 Input voltage 100Vac to 240Vac	SCU-350	YT21Z0Z01	<input type="checkbox"/>	Standard	
	SCU-350	YT21ZEZ20	<input type="checkbox"/>	With RS232C	
	SCU-350A	YT21ZCZ00	<input type="checkbox"/>	With ABS* <sup>1</sup> function	
	SCU-350A	YT21ZФЗ00	<input type="checkbox"/>	ABS function, RS232C	
	SCU-350H	YT21Z4Z00	<input type="checkbox"/>	With STP-200/300/400 series compatible remote input / output connector (CON4)	
	SCU-350HA	YT21ZDZ00	<input type="checkbox"/>	With STP-200/300/400 series compatible remote input / output connector (CON4), with ABS* <sup>1</sup> function	
(3) Power cable	Please select cable length.			Crimping terminal size is M4. 	
	3m	B70700090	<input type="checkbox"/>		
	5m	B70700040	<input type="checkbox"/>		
	10m	PT21Y0A00	<input type="checkbox"/>		
	15m	PT21Y0A01	<input type="checkbox"/>		
(4) STP connection cable	Please select connector type and cable length.				
	Both side straight connector	3m	B70700010		<input type="checkbox"/>
		5m	B70700000		<input type="checkbox"/>
		10m	B70700130		<input type="checkbox"/>
		15m	B70700070		<input type="checkbox"/>
		20m	B70700150	<input type="checkbox"/>	
	- Pump side L-type connector ( $\alpha=0^\circ$ ) - Controller side straight	3m	PT21Y3B00	<input type="checkbox"/>	Need to select angle for L-type connector. 
		5m	PT21Y3B01	<input type="checkbox"/>	
	- Pump side L-type connector ( $\alpha=270^\circ$ ) - Controller side straight	3m	B70700240	<input type="checkbox"/>	
		5m	B70700110	<input type="checkbox"/>	
		10m	PT21Y3B05	<input type="checkbox"/>	
		15m	B70700140	<input type="checkbox"/>	
		20m	B70700100	<input type="checkbox"/>	
		Instruction Manual			

\* Maximum length of all cables is 30 m.

\*<sup>1</sup> ABS: Automatic Balancing System. The vibration reduction function of the STP pump.

## Option Parts Selection Sheet - 1

### Selection and Use of Optional Parts

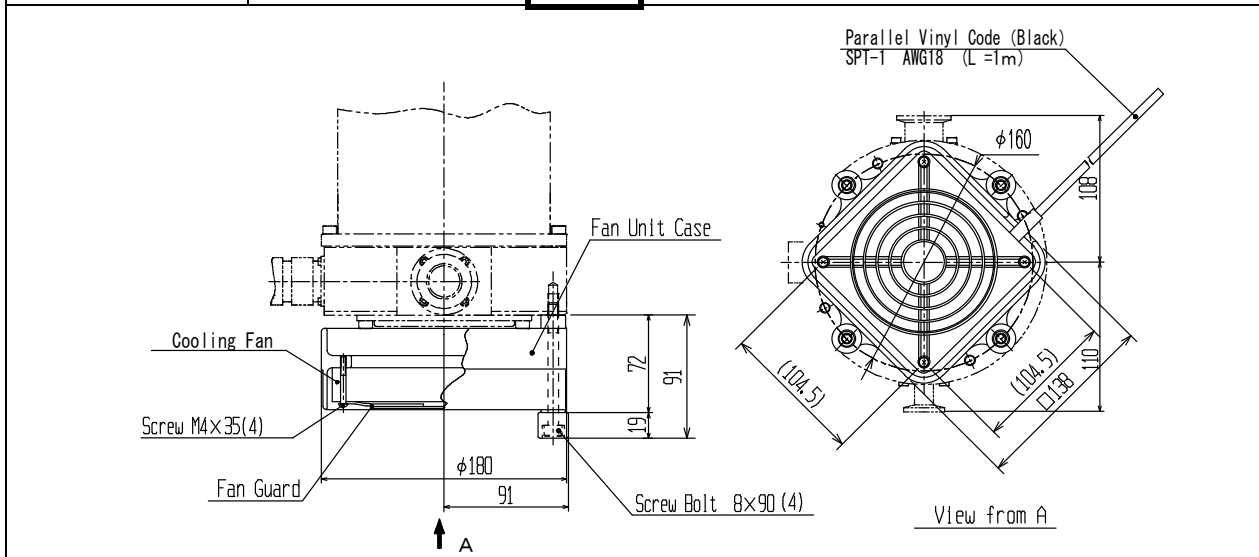
Item	Remark
Air-cooling unit	Pump cooling (when pumping gas or baking)
Damper	It reduces the vibration from the pump to the equipment

Please tick the boxes to order the components.

### Air-cooling unit

Select input voltage.

Input voltage	Part number	Select	Note
100Vac spec.	B74834000	<input type="checkbox"/>	Single phase 100V, 11.0/9.5W (50/60Hz), with cable 1m
200Vac spec.	PT011A000	<input type="checkbox"/>	Single phase 200V, 11.0/9.5W (50/60Hz), with cable 1m



### Damper

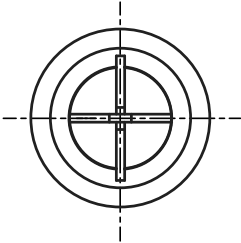
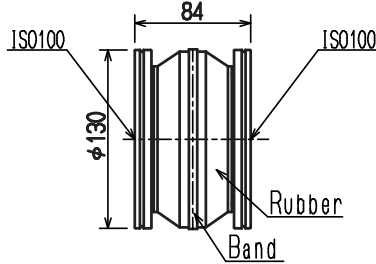
Select flange size.

Flange size	Part number	Select	Note
ISO100	B58046000	<input type="checkbox"/>	Damper external view (see the next page)
ISO160	B58049000	<input type="checkbox"/>	
VG100	PT01QDE00	<input type="checkbox"/>	
VG150	PT01QDF00	<input type="checkbox"/>	
ICF152	B74834010	<input type="checkbox"/>	
ICF203	B70652040	<input type="checkbox"/>	

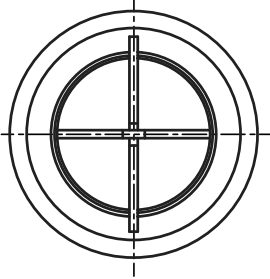
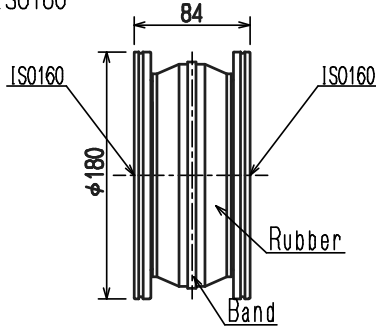
### Option Parts Selection Sheet - 2

\* Damper contracts approximately 3mm during vacuuming.

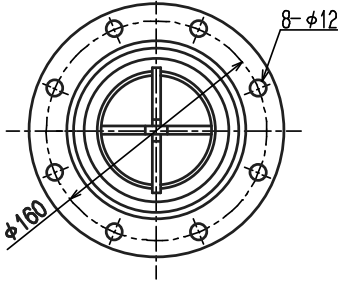
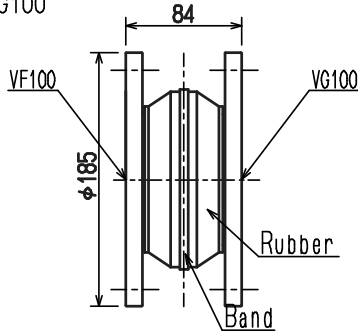
ISO100



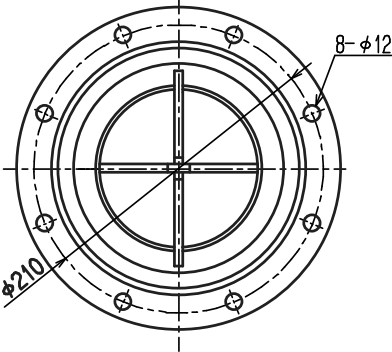
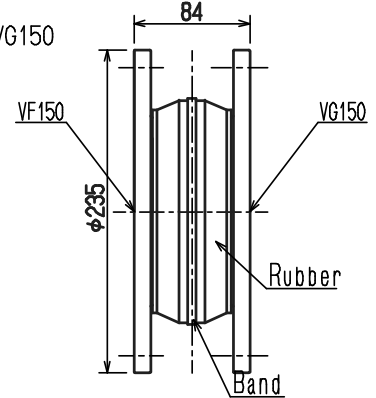
ISO160



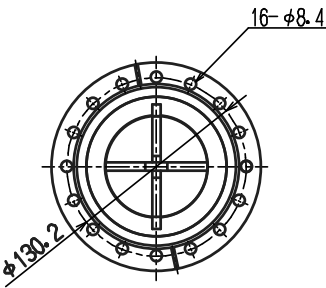
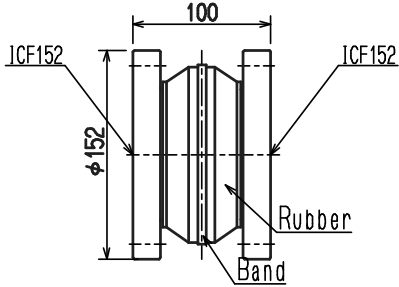
VG100



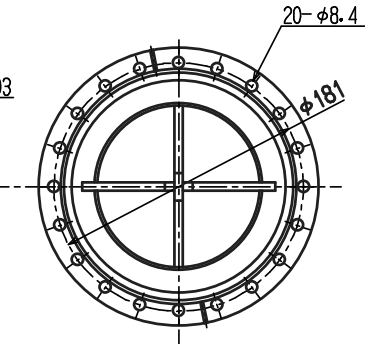
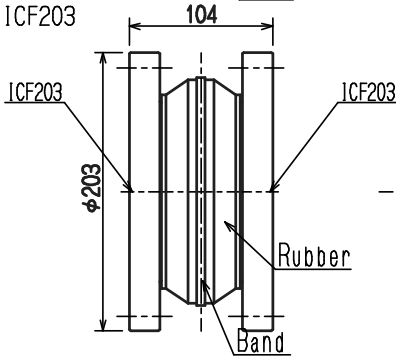
VG150



ICF152



ICF203



External view of damper