TORONTECH™

CATALOGUE

2014

TTABG-Diesel Engine Fire Fighting Pump

PRODUCT BROCHURE

TORONTECH™
PUMPS

TORONTECH.COM

TORONTECH™

Torontech™ is a leading North American based international manufacturer and supplier of pumps, pipes, valves & actuators. The Torontech™ group has established an extensive network in the USA as well as international markets and remains to be a preferred vendor of choice supplying quality pumps for today's leading corporations.

Creating comprehensive solutions for our clients has always been the core value of our company. From sales, to order execution, and post-sales support; every staff member is here to assist you in selecting the solution that best suits your unique requirements and budget.

The Torontech™ group offers a complete range of quality pumps that are,ANSI to ISO approved and engineered to last, ensuring your company continuous production without interruptions.

Since the beginning, we have succeeded in only offering quality manufactured pumps that are currently being used worldwide. We offer the best value for your investment and provide world-class support.

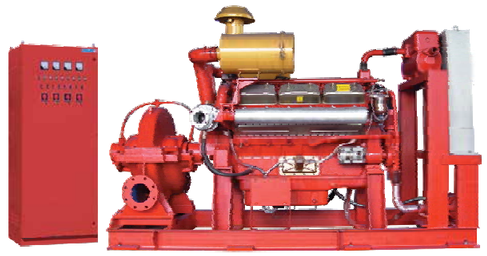
Due to the demand for our quality pumps, Torontech™ has experience explosive growth primarily in the oil & gas, water filtration and chemical refinery industries.

We offer an extensive range of solutions and products for oil & gas projects, refineries, petrochemical plants, and marine applications. Our main class of pumps includes API (American Petroleum Institute) Standard, Mining, Water & Sewage and Firefighting applications. The pumps are offered in various configurations depending on orientation of the pump, required head and type of fuel used for operation.

CONTENTS

TORONTECH™
Pumps and Valves
TTABG

Summary to application type of diesel engine pump group

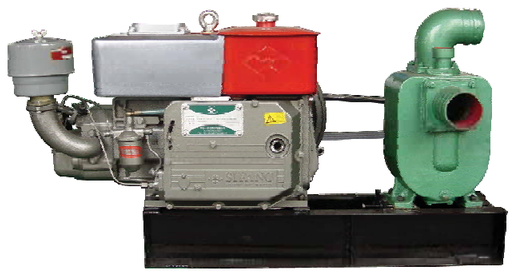


TTABG -XBC series diesel engine fire-fighting/emergency pump group

Applicable for water supply for fire service and emergency water supply.

Agricultural diesel engine pump unit is generally composed of self-priming pump. The sel f-priming pump is light moveable water pump. It has such advantages as small volume, light weight, excellent performance, convenient operation, reliable use, easy maintenance and wide applicable range. It can be widely used for agricultural irrigation and water supply in factory, mine, construction site and daily life.

1. When adopting triangle belt for transmission, the spindle of driving engine shall be parallel with pump shaft and the belt wheels shall be aligned. The central distance shall not be lower than twice of the diameter of the two belt wheels.



When the water pump is directly connected with the driving engine, they shall be equipped with same chassis. Adopt claw type flexible coupler and check the coupler part with steel rule to ensure the coaxiality of pump shaft and driving spindle.

2. Before the self-priming pump is started, water must be poured into the pump body to avoid influencing the self-priming function. It is forbidden to operate without storing water to prevent the sealing parts being burnt. Be fore the centrifugal pump is started, first add water into the pump and start it until the water fills the inlet pipe and pump body.

Torontech Inc. - Canada
North American Headquarters
Tel: +1.416.368.2721
Fax: +1.416.981.7652
Email: sales@torontech.com
www.Torontech.com

Moveable diesel engine pump group

Moveable diesel engine pump unit is commonly used in the fire and municipal water drainage pump unit for agricultural irrigation, warehouse and dock. For small type unit, manual pushing type can be adopted, and for larger unit, vehicle dragging type can be adopted.

Pushing type moveable pump group

Vehicle dragging type moveable pump unit

Outdoor fixed diesel engine pump group

In case of outdoor fixed installation, the diesel engine pump unit shall be assembled with outdoor type protective cover additionally.

Diesel engine pump group with vertical axial line

For deep well pump, ZLB model dry axial flow pump, YW model submersible drainage pump and NL model slurry pump etc. pump units requiring diesel engine as driving power that are vertical to axial line of diesel engine, the right angle steering gear and steering shaft structure researched and developed by our company can be adopted to realize the stable and reliable operation of pump unit, and is especially applicable for pump use in field operation.

Outline

TTABG-XBC series diesel engine fire-fighting pump group is a new-style fire-fighting equipment ("equipment" thereafter) developed by this Co. in accordance with Installation of cen- trifugal fire-fighting pumps etc. standards and, upon the fitted firefighting pumps (single-stage single-suction type, single-stage dual-suction type and sectional multistage type), canbe divided into TTABG-SBC-is, TTABG-XBC-SLOW and TTABG-XBC-D three sub-series. The equipment has a wide range of pressure and temperature and can be used for almost every occasion necessary for fire-fighting.

The diesel engine fitted with the equipment is an excellent product domestic or imported, features good starting performance, strong overload capacity, compact structure, easy maintenance and use and high degree of automation. The equipment is really a fire-fighting one advanced and reliable in performance.

Torontech Inc. - Canada
North American Headquarters
Tel: +1.416.368.2721
Fax: +1.416.981.7652
Email: sales@torontech.com
www.Torontech.com

Torontech Inc. - Canada
North American Headquarters
Tel: +1.416.368.2721
Fax: +1.416.981.7652
Email: sales@torontech.com
www.Torontech.com

Structural characteristic and functions

The equipment takes X6135, 12V135, 4102, 4105, 6102 etc.series diesel engines as the power and these diesel engines (can be fitted with clutches) are combined with fire-fighting pumps through high elastic clutches to form the fire-fighting pump group, including diesel tank, radiation water tank, blower, bontrol screen (for the auto group) etc.parts.

As the auto-control group, a separate diesel engine autocontrol cabinet (programmable) carries out the system's automatic starting, putting into use, auto-switching (the motor pump group is switched to the diesel engine pump one or the diesel engine pump group to another group), auto-protection (warning and stopping protection for the diesel engine's overspeed, lower oil pressure, hogh water temperature, three times failures of starting, low voltage of accumulator etc.) etc.functions and also can be connected to fire-fighting centers of users or the autowarning device of fire to get a remote monitoring.

To ensure the group to normally working anenvironment of below 5°C, it can be fitted with and AC220V cooling-water preheater.

The diesel engine fire-fighting pump group can be formed as an automatic fire-fighting water-supply system (see Fig.1) together with an electric pump one, pressure stabilizing pump one etc. and the working process is introduced in "Diesel engine control system". The equipment can be jointly controlled with a fire-fighting center.

The mode of water inlet of a fire-fighting pump can be self-pouring and suction-up and, upon the requirement in the fire-fighting standard, the former is generally used. It needs to specially note in case of the need of the latter so as for this Co. to supply the automatic vacuum waterleading device, however, the dimensions of the pump group have to be changed somehow.

TORONTECH™
Pumps and Valves
TTABG

TTABG-Diesel Engine Fire Fighting Pump

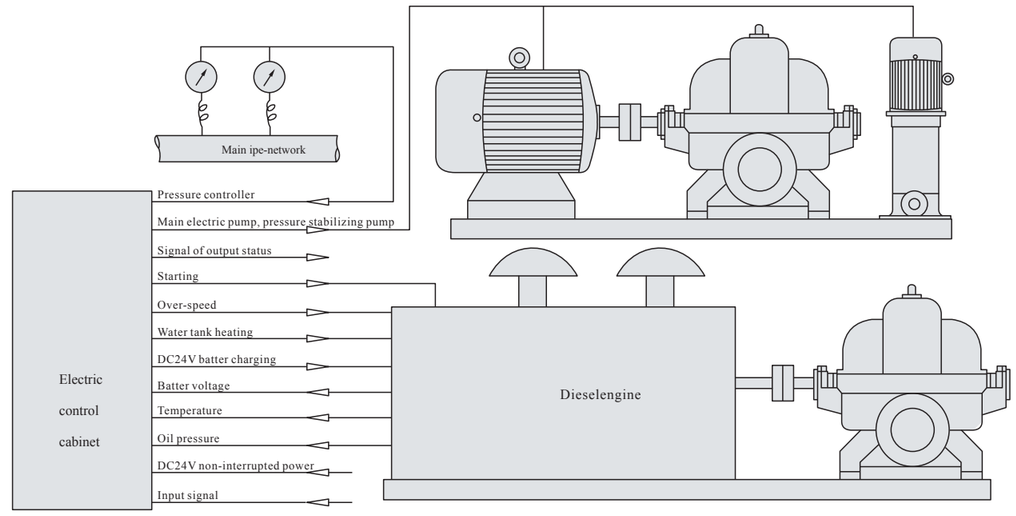


Fig.1

Diesel engine control system

Model and meaning

TTABGLEC – □ □ – □

- power of diesel engine shaft
- H— semi-auto control
- Z— fully-auto control
- B—diesel engine pump control
- D—diesel generator control
- control feature of Liancheng diesel engine control cabinet

Fields of application

Applicable for the TTABG-XBC series diesel engine fire-fighting pump control made in this Co., and also for the diesel engine fire-fighting pump and diesel generator controls of users.

System structure and principle

1. Control equipment of TTABG-LEC-BZ(H) series diesel engine pump group.

Torontech Inc. - Canada
North American Headquarters
Tel: +1.416.368.2721
Fax: +1.416.981.7652
Email: sales@torontech.com
www.Torontech.com

Torontech Inc. - Canada
North American Headquarters
Tel: +1.416.368.2721
Fax: +1.416.981.7652
Email: sales@torontech.com
www.Torontech.com

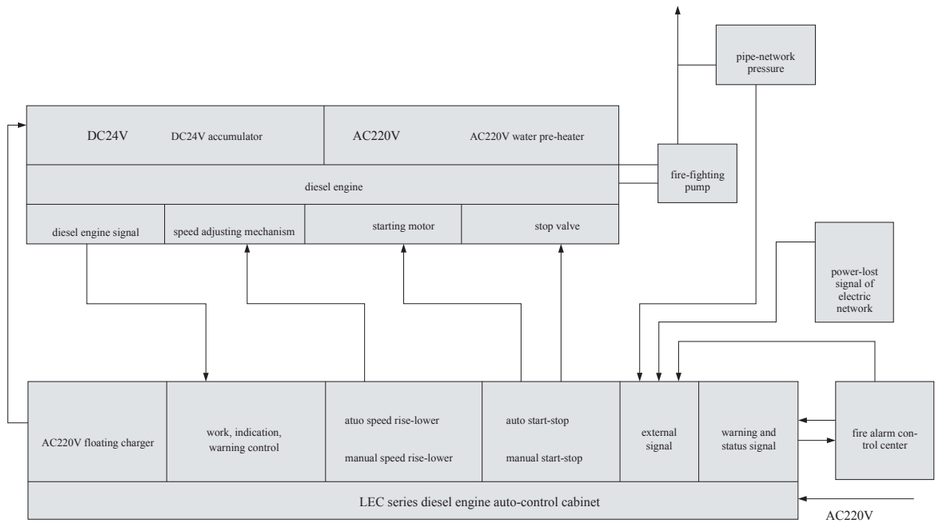


Fig.2

Schematic drawing of auto-control system of diesel engine fire-fighting pump group

Electric fire-fighting water-supply system is generally formed with a pressure stabilizing pump, electric pump(main pump) and automatic diesel enging pump(spare one) and its principle of work comes like this: usually the pipe-network's pressure keeps in between P1(low one)-P2(high one). The stabilizing pump starts once the pressure belows P1 and stops when it rises to P2. It lowers slowly from P2 to P1 due to the leakage of the network, thestabilizing pump starts again to keep it in between P1-P2. When the water quantity being used is greatly increased, the said pump can not keep the pressure at P1 and it quickly lowers to P3, the electric pump starts and the pressure rises to Pw(well) to meet with the demand for fire-fighting water. In case of power-off or a failure with the electric pump, the pressure goes on lowering from P3 to P4, the diesel engine pump automatically starts to have it rise to Pw for water supply. The electric pump or diesel engine one has to be stopped through artificial judgement and, if the leakage from the pipe-network is estimated much, it is necessary to increase pressure stabilizing tanks or make the pressure stabilizing pump normally opened so as to avoid frequedt starting.

Torontech Inc. - Canada
North American Headquarters
Tel: +1.416.368.2721
Fax: +1.416.981.7652
Email: sales@torontech.com
www.Torontech.com

TORONTECH™
Pumps and Valves
TTABG

TTABG-Diesel Engine Fire Fighting Pump

(1)TTABG-LEC-BH series semi-auto fire-fighting diesel engine pump's control equipment

This electric control cabinet(box) has both manual and semiauto control function and can display the oil pressure and water temperature of the diesel engine; the charging current of the accumulator; warn at too-low level of the oil tank; automatically start the diesel engine pump in case of a failure with the electric pump or power-off under the fire-alarm status and remotely start the diesel engine pump. This control mode is used for such an occasion as the power of the diesel engine is less than 110kW in general.

(2) TTABG-LEC-BZ series fully-auto fire-fighting diesel engine pump's control equipment

This electric control cabinet(box) has both manual and fully-auto control function and can display the diesel engine's oil pressure and temperature and water temperature and the accumulator's charging current, watrn at an abnormal condition and when the level of the oil tank is too low, as well as at an extra high speed or low speed for stopping and when three startings are successively failed, automatically(also remotely) start or stop the diesel engine pump and charge the accumulator when its voltage becomes low and be connected to a fire-fighting center or an automatic fire-alarm device to carry out the remotely linkage control. And in case of a multi-pump unit, can also carry out the switching between the units, the periodical tour-inspection of the fire-fighting pumps and the voltage constant of power frequency(but this function needs to be noted by the user in the contract). This control mode is generally used for such an occasion as the power of the diesel engine is more than 110kW.

2. TTABG-LEC-DZ(H) series diesel generator's control equipment

The control principle of the diesel generator is similar to the diesel engine control fitted for the diesel engine pump and mainly used for the self-equipped emergent diesel generator unit of a voltage 280/440V in civil buildings, the unit should be ready for starting at any time and the operation power, the thermodynamic system, fuel oil, lubricating oil, cooling water, indoor ambient temperature etc. should all ensure the unit to be started at any time. When the local power is off, the unit should be started at once and put into run with a load normally within 15s. the unit should be linkage with the electric power system and delayed to be switched to the local power when it is reset and automatically stop after 3-5min idle movement.

Torontech Inc. - Canada
North American Headquarters
Tel: +1.416.368.2721
Fax: +1.416.981.7652
Email: sales@torontech.com
www.Torontech.com

(1) TTABG-LEC-DH series semi-auto diesel generator's control equipment

This electric control cabinet(box) has the manual and semiauto control function and can display the diesel egine's oil pressure and water temperature, the accumulator's charging current and warn when the level of the oil tank becomes too low, when it works at the semi-auto control, the diesel engine has to be artificially started and enhanced with its rotating speed to the rated one. when the electricity from the generator gets normal, artificially turn on the breaker to electrify the load. The generator also needs to be artificially stopped.

(2) TTABG-LEC-DZ series fully-auto diesel generator's control equipment

This electric control cabinet(box) has both manual and fullyauto control function and can display the diesel engine's oil pressure and temperature and water temperature, and the accumulator's charging current, warn at an abnormal condition, at a too-low level of the oil tank, at an extra high speed or low speed and at successive three failures of starting, automatically(also remotely) start or stop the generator and charge the accumulator when its voltage gets low and be connected to the control center to reach the remotel linkaged control. It is controlled by PLC in the automatic mode of work for starting the generator and electrifying the load as well as stopping the generator. The system will automatically stop in case of an abnormal failure.

Model meaning

TTABG-XBC 8 / 50 - IS

- IS: fire-fighting pump type (IS, SLOW, D as single-stage single-suction type, single-stage dual-suction type, sectional multi-stage type separately)
- 50: rated flow (L/s) of pump group
- 8: 10 times the rated pressure of pump (MPa)
- XBC: diesel engine fire-fighting pump group

Purpose

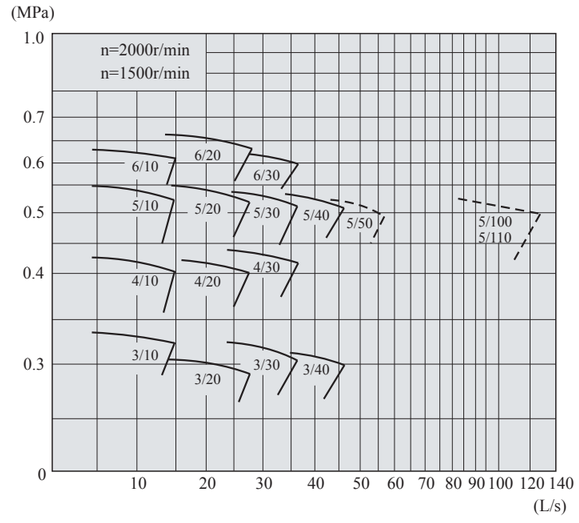
Suitable for the fire-fighting water supply and emergency water supply in storehouse, yard, airport, petroleum and chemical industry, power plant, liquefied gas, textile, ship, oil ship etc.ocxasions.

Torontech Inc. - Canada
North American Headquarters
Tel: +1.416.368.2721
Fax: +1.416.981.7652
Email: sales@torontech.com
www.Torontech.com

TORONTECH™ Pumps and Valves
TTABG

TTABG-Diesel Engine Fire Fighting Pump

TTABG-XBC–IS type pump atlas of style and performance



Type	Rating speed (r/mim)	Rating capacity (L/s)	Rating pressure (MPa)	Eff. (%)	(NPSH)r (m)	Stalk power (kW)	Fitted power of the diesel engine. (kW)	In-outlet caliber (mm)	Weight (kg)
5/50	1500	50	0.5	75	2.8	36.3	⩾47.19	150/125	212
5/100	1500	100	0.5	81	3.8	67.2	⩾80.64	200/150	245
5/110	1500	110	0.5	81	4.5	68.4	⩾82.08	200/150	245
3/10	2000	10	0.3	71	2.5	8.2	⩾10.66	100/65	91
3/20	2000	20	0.3	71	3.0	9.5	⩾12.35	100/65	91
3/30	2000	30	0.3	59	3.8	16.8	⩾21.84	125/100	129
3/40	2000	40	0.3	77	4.8	18.5	⩾24.05	125/100	129
4/10	2000	10	0.4	71	2.5	10.0	⩾13.00	100/65	91
4/20	2000	20	0.4	77	3.0	11.2	⩾14.56	125/100	129
4/30	2000	30	0.4	74	3.6	13.2	⩾17.16	125/100	145
5/10	2000	10	0.5	65	4.2	14.8	⩾19.24	100/65	120
5/20	2000	20	0.5	65	4.5	19.9	⩾25.87	100/65	120
5/30	2000	30	0.5	74	4.5	25.7	⩾33.41	125/100	145
5/40	2000	40	0.5	74	4.9	32.8	⩾42.64	125/100	145
6/10	2000	10	0.6	65	2.5	17.2	⩾22.36	100/65	120
6/20	2000	20	0.6	74	3.0	19.7	⩾25.61	125/100	145
6/30	2000	30	0.6	74	3.6	29.7	⩾38.61	125/100	145

Note: the installation dimensions of the pump are variable along with the different diesel engines and will therefore be provided by this Co. after signing the contract.

Torontech Inc. - Canada
North American Headquarters
Tel: +1.416.368.2721
Fax: +1.416.981.7652
Email: sales@torontech.com
www.Torontech.com

TTABG- XBC–SLOW type pump performance

Type	Rating speed (r/mim)	Rating capacity (L/s)	Rating pressure (MPa)	Eff. (%)	(NPSH)r (m)	Stalk power (kW)	Fitted power of the diesel engine. (kW)	In-outlet caliber (mm)	Weight (kg)
3/30	2000	30	0.3	76	4.5	15.3	⩾19.89	125/80	194
3/40	2000	40	0.3	80.8	4.5	17.3	⩾22.49	150/100	207
3/50	2000	50	0.3	81.7	6.8	22.1	⩾28.73	150/100	207
4/30	2000	30	0.4	77.7	4.5	18.5	⩾24.05	125/80	204
4/50	2000	50	0.4	81	6.8	28.4	⩾36.92	200/125	274
4/60	2000	50	0.4	78.5	6.8	30.2	⩾39.26	150/100	223
4/90	2000	90	0.4	81	8.4	43.5	⩾56.55	200/125	274
5/50	2000	50	0.5	76.8	6.8	35.8	⩾46.54	150/100	223
5/60	2000	60	0.5	79	7.1	38.1	⩾49.53	150/100	223
5/70	2000	70	0.5	79.1	7.2	48.4	⩾62.92	150/100	223
5/100	2000	100	0.5	83.1	8.9	57.8	⩾75.14	200/125	274
6/20	2000	20	0.6	79	6.3	19.3	⩾25.09	150/100	223
7/30	2000	30	0.7	79	6.5	28.6	⩾37.18	150/100	223
5/30	1500	30	0.5	72	2.5	28.1	⩾36.53	150/100	245
5/40	1500	40	0.5	72	3.1	32.1	⩾41.73	150/100	245
5/50	1500	50	0.5	73	2.5	36	⩾46.8	150/100	245
6/80	1500	80	0.6	78	2.7	58.1	⩾75.53	200/125	335
7/80	1500	80	0.7	79	2.7	70.6	⩾84.72	200/125	335
6/120	1500	120	0.6	81	3.4	88.8	⩾106.56	200/150	436
8/120	1500	120	0.8	78	4.2	123.7	⩾148.44	200/150	646
6/150	1500	150	0.6	81	3	114.4	⩾137.28	200/150	436
9/150	1500	150	0.9	79	4.2	166.7	⩾200.04	200/150	646
12/150	1500	150	1.2	76	2.9	247.9	⩾297.48	250/200	990
15/150	1500	150	1.5	74	3.5	298	⩾357.6	200/150	1760
6/200	1500	200	0.6	80	3.5	147.1	⩾176.52	250/200	840
8/200	1500	200	0.8	82	3	199.6	⩾239.52	250/200	840
9/220	1500	220	0.9	83	3.5	233.8	⩾280.56	250/200	840
15/220	1500	220	1.5	80	3.1	404.4	⩾485.28	250/200	1000
5/250	1500	250	0.5	82	3.5	149.5	⩾179.4	300/250	930
7/250	1500	250	0.7	85	3.3	201.8	⩾242.16	300/250	930
5/300	1500	300	0.5	85	3.3	173	⩾207.6	300/250	930
7/300	1500	300	0.7	86	3.3	239.4	⩾287.28	300/250	930
8/300	1500	300	0.8	83	3.8	283.5	⩾340.2	300/250	1400
10/300	1500	300	1.0	84	3.8	350	⩾420	300/250	1400
12/300	1500	300	1.2	84	3.8	420	⩾504	300/250	1400
7/350	1500	350	0.7	83	3.9	289.4	⩾347.28	400/300	2097
9/350	1500	350	0.9	84	8.4	367.6	⩾441.12	400/300	2097
10/350	1500	350	1.0	85	4.2	403.7	⩾484.44	400/300	2097
12/350	1500	350	1.2	84	3.5	490.2	⩾588.24	400/300	2600
8/400	1500	400	0.8	85	4.2	369.1	⩾442.92	400/300	2097
10/400	1500	400	1.0	86	4.2	456	⩾547.2	400/300	2097
12/400	1500	400	1.2	83	4	567	⩾680.4	400/300	2600
8/450	1500	450	0.8	85	4.2	415.2	⩾498.24	400/300	2097
9/450	1500	450	0.9	85	4.2	467	⩾560.4	400/300	2097
12/450	1500	450	1.2	83	4	637.8	⩾765.36	400/300	2600
14/450	1500	450	1.4	84	4	735.3	⩾882.36	400/300	2600
16/450	1500	450	1.6	85	3.5	830.4	⩾996.48	400/300	2600

Note: the installation dimensions of the pump are variable along with the different diesel engines and will therefore be provided by this Co. after signing the contract.

TORONTECH™
Pumps and Valves
TTABG

TTABG-Diesel Engine Fire Fighting Pump

TTABG-XBC–D type pump performance

Type	Rating speed (r/mim)	Rating capacity (L/s)	Rating pressure (MPa)	Eff. (%)	(NPSH)r (m)	Stalk power (kW)	Fitted power of the diesel engine. (kW)	Inlet caliber (mm)	Weight (kg)
9/25	3000	25	0.9	72	4.2	28.9	⩾34.7	100	199
13/25	3000	25	1.3	72	4.2	43.4	⩾56.5	100	225
17/25	3000	25	1.7	72	4.2	57.9	⩾75.3	100	250
21/25	3000	25	2.1	72	4.2	72.3	⩾94	100	275
6/40	1500	40	0.6	77	3.9	32.8	⩾39.4	150	490
9/40	1500	40	0.9	77	3.9	49.3	⩾64.1	150	560
12/40	1500	40	1.2	77	3.9	65.7	⩾85.5	150	630
15/40	1500	40	1.5	77	3.9	82.1	⩾106.8	150	700
18/40	1500	40	1.8	77	3.9	98.5	⩾128.1	150	770
8/80	1500	80	0.8	77	4.7	85.2	⩾110.8	200	667
12/80	1500	80	1.2	77	4.7	127.7	⩾166.1	200	787
16/80	1500	80	1.6	77	4.7	170.3	⩾221.4	200	907
20/80	1500	80	2.0	77	4.7	212.9	⩾276.8	200	1027
18/125	1500	125	1.8	79	4.9	279.2	⩾363	250	1851

Note: the installation dimensions of the pump are variable along with the different diesel engines and will therefore be provided by this Co. after signing the contract.

Range of supply

The range of supply includes diesel engine(covering oil tank and accumulator), fire-fighting pump, high elastic clutch and the foundation for their combination and the electric control cabinet for control, and, if to form an auto fire-fighting water supply system with the electric fire-fighting pump, pressure stabilizing pump etc.made in this Co., still includes the electric fire-fighting pump, pressure stabilizing pump group and pressure controller, the cable for the joint between both control cabinet and pump group is excluded.

Torontech Inc. - Canada
North American Headquarters
Tel: +1.416.368.2721
Fax: +1.416.981.7652
Email: sales@torontech.com
www.Torontech.com

Torontech Inc. - Canada
North American Headquarters
Tel: +1.416.368.2721
Fax: +1.416.981.7652
Email: sales@torontech.com
www.Torontech.com

Cooling mode of generator

The cooling system of the oil engine supplied by this Co is generally in a closed cycle and functions cooling in such a way as both generator's surface and radiating water take heat exchange with the airflow produced by its blower. Please make a note at order if requiring an opened cycle of cooling(i.e.cooling of the generator is carried out by way of a heat exchanger between the cooling water transported through a water pump and the cycling water inside of the diesel engine).

Power loss of diesel engine

Under non-normal operation condition of the equipment, the power loss of diesel engine is: $\triangle Ne=KNe$(Ne is rated power of diesel engine). Therefore, to guarantee normal operation of diesel engine, when selecting diesel engine, the matching of its power and the pump shall take the power loss under non-normal environmental condition of its operation into consideration so as to guarantee the reasonable matching of power of diesel engine and pump. Refer to K value in the following form.

Form of power loss coefficient K value of diesel engine

Altitude (m)	Environmental temperature (°C)									
	0	5	10	15	20	25	30	35	40	45
0	0	0	0	0	0	0	0	0	0	0.12
200	0	0	0	0	0	0	0	0	0	0.125
400	0	0	0	0	0	0	0	0	0	0.138
600	0	0	0	0	0	0	0	0	0	0.152
800	0	0	0	0	0	0	0	0	0	0.171
1000	0	0	0	0	0	0	0	0	0.121	0.179
1500	0	0	0	0	0	0	0.137	0.141	0.191	0.198
2000	0	0	0	0	0.12	0.137	0.174	0.179	0.223	0.249
250	0	0	0	0.121	0.156	0.187	0.212	0.237	0.258	0.281
3000	0	0	0.118	0.165	0.193	0.222	0.238	0.271	0.287	0.307
3500	0	0.137	0.169	0.207	0.228	0.254	0.277	0.311	0.319	0.338
4000	0.145	0.182	0.208	0.238	0.264	0.288	0.311	0.336	0.346	0.366

Torontech Inc. - Canada
North American Headquarters
Tel: +1.416.368.2721
Fax: +1.416.981.7652
Email: sales@torontech.com
www.Torontech.com

TORONTECH™ Pumps and Valves
TTABG

Volume of oil tank

The oil tank used for the diesel engine of a power below 200kW can be directly mounted on the unit while the one for the diesel engine of a power over 200kW can be separated from the unit. The following listed oil tank's volumes can ensure the diesel engine fire -fighting pump groups of different powers to normally work under the rated working condition for 8 hours.

(kW) diesel engine	30	34	37	53	60	74	88	110	120	161	220	279	339
(L) oil tank	60	60	60	80	80	120	120	160	160	230	300	390	460

Precautions at the equipment installation

1. About 1m passage and space should be left on both side of the unit and in the front of both cooling blower and water tank to be of help for a better radiation, equipment service and maintenance. The height of the machine room should be depended on the equipment's height and the lifing apparatus, 3-5m as the effective height in general.
2. The unit basis uses concrete structure in general and its round dimensions are the four peripheries of the unit feet plus 150-200mm and depth is 400-600mm. The foot bolt stretches out of the bolt hole by a height about 2 times the diameter of the bolt and a notch is set in the middle of the basis and grooves are set round it for dirt oil and water discharge. The concrete foundation must be solid and flat and, when to put the unit on it, place washers in between both unit bottom seat and basis on both left and right sides of the foot bolt, the washers must be flat. Put a leveller on the pump shaft for correction to ensure the level of the driving shaft. After adjusting both bottom seat and pump, pour cement around the foot bolt, then after the cement gets hardened, evenly tighten the foot bolt, then pour cement on the bottom seat to make sure of the unit stable and solid. finally correct the concentricity between the fire-fighting pump and the diesel engine's drving shafts, and the outer circles of the two clutches must be linear and with an equal interval.

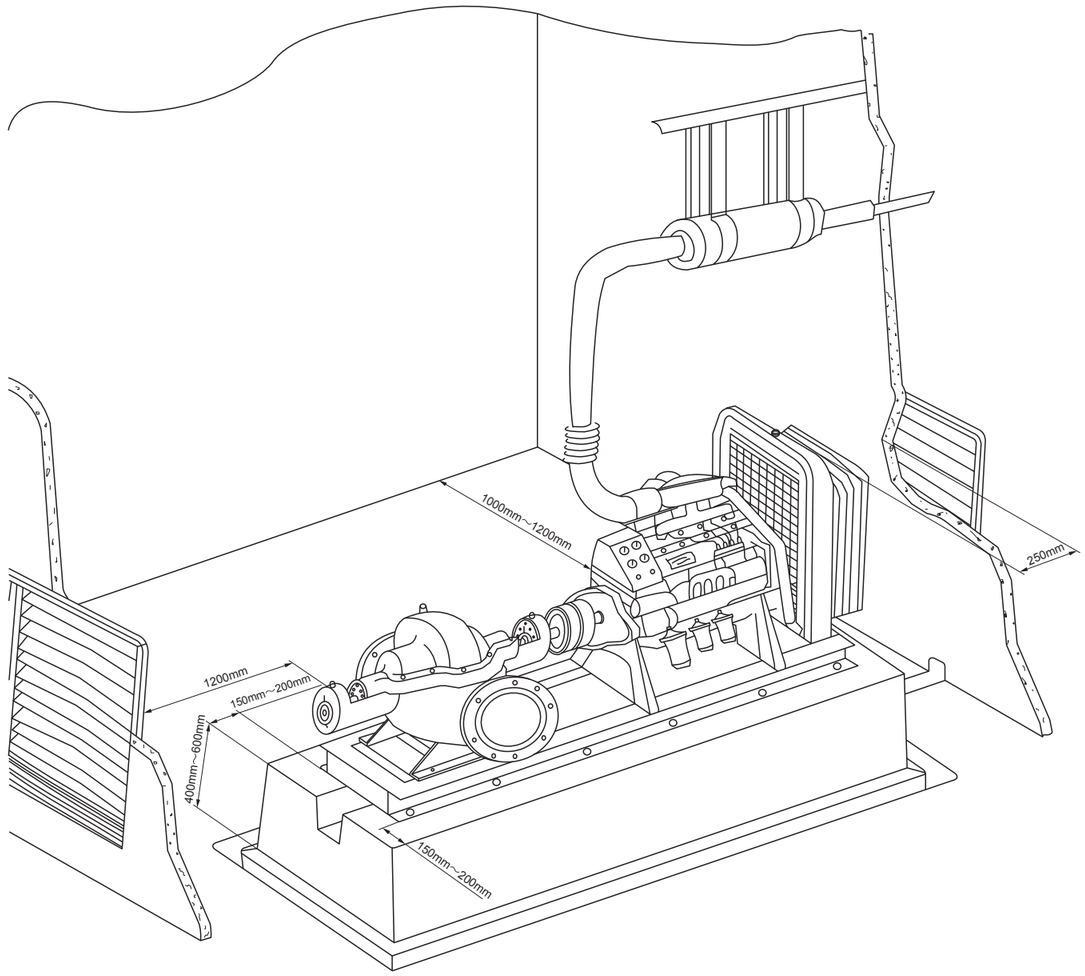
Torontech Inc. - Canada
North American Headquarters
Tel: +1.416.368.2721
Fax: +1.416.981.7652
Email: sales@torontech.com
www.Torontech.com

3. To ensure a good ventilation inside of the machine room, the temperature there should not be over 40℃ and enough venting holes must be set. When natureal ventilation is not sufficient for the venting and radiating requirement, mount intake ventilators on the venting holes to strengthen the ventilating property of the room.
4. To ensure a fresh air inside of the machine room, it is necessary to prevent lots of heat from radiating inside and lower the noise. wrap the exhaust pipe of the diesel engine with asbestos, extend it outdoor and mount a rain-proof device on it or mount it 30° downward and a silenser. The number of the elbow on it should be as less as possibe and the bent radius of the elbow should be over 2.5 times the outer diameter of the exhause pipe, take it into consideration for the support of the pipe to lower vibration and prevent its weight from loading on the diesel engine.
5. When to mount both inlet and outlet pipes of the fire-fighting pump, do not let their weight loading on the pump so as to prevent it against damage and its performance of running from being affected. The inlet pipe should be as short and straight as possible and, when it is as self-pouring, it must be mounted upward tiltedly towards the pump to make sure no air exists inside of the pipe. A filter screen and flexible connector should be mounted on the inlet and flexible connector, check valve and gate vlave on the outlet.
6. It is not allowed to mount the control cabinet in the front of the diesel engine's radiator, otherwise the electric components inside of the cabinet would be affected and not work normally and it should be mounted on both sides of the unit or close to it so as to get a convenient operation. The wiring between both control cabinet and diesel engine should not be over 35m.

Torontech Inc. - Canada
North American Headquarters
Tel: +1.416.368.2721
Fax: +1.416.981.7652
Email: sales@torontech.com
www.Torontech.com

TORONTECH™
Pumps and Valves
TTABG

Diesel engine fire–fighting pump engine room arrange diagram



(Fig. 6)

Torontech Inc. - Canada
North American Headquarters
Tel: +1.416.368.2721
Fax: +1.416.981.7652
Email: sales@torontech.com
www.Torontech.com

Star,stop and run of the equipment

1. Start: first make sure of the correct rorating direction of the fire fighting pump and the inlet valve is as N.O and outlet valve N.C. Before the pipe network starts with no water. After no error is found, start the fire-fighting pump and, when the pump gets stable run, gradually open the outlet valve and adjust it to the work condition point for the pump to run. The outlet valve is N.O.when the network is filled with water at usual.
2. Run:when the pump gets a normal run, check the shaft seal and the bearing to see how it works. The leakage for the mechanical seal should not be over 3 draops/min and for the stuffing seal should be dot drop. The bearing's temperature should not be over 75°C and its temperature rise not over 95°C。Stop running for a check ing case of an abnormal sound during the pump's run.
3. To stop, first close the outlet valve, then the diesel engine.

Maintenance

1. According to the requirement in the fire-fighting standard, the unit must run once at least every 15-day with time not less than 15minutes so as make sure of it in a good status at any time.
2. Every time to start the fire-fighting opump, it should be done to check if the shaft seal is normal and if it needs to be adjusted or replaced.
3. Periodically lubricate the bearing with grease.
4. Completely drain the water inside of the pump out in case of a long time stop of the opump to prevent the pump casing etc. Parts from being frozen to result in split due to extra low ambient temperature.
5. according to the provision for the maintenance of the diesel engine, daily maintenance should be kept for it by checking if the cooling water quantity, engine oil quaqntity, the accumulator's voltage, oil-pressure meter, thermometer, speed-ometer and other control devices are normal.

Torontech Inc. - Canada
North American Headquarters
Tel: +1.416.368.2721
Fax: +1.416.981.7652
Email: sales@torontech.com
www.Torontech.com

TORONTECH™

Torontech™– North America
TEL:+1 (416) 368-2721
FAX:+1 (416) 981-7652
E-MAIL: sales@Torontech.com
WEB:www.Torontech.com

Please contact us for your nearest local office or distributor

Torontech Inc. - Canada
North American Headquarters
Tel: +1.416.368.2721
Fax: +1.416.981.7652
Email: sales@torontech.com
www.Torontech.com