

TBTS 系列 SERIES

变频调速恒压供水设备

Variable-frequency speed-control
constant-pressure water supply equipment

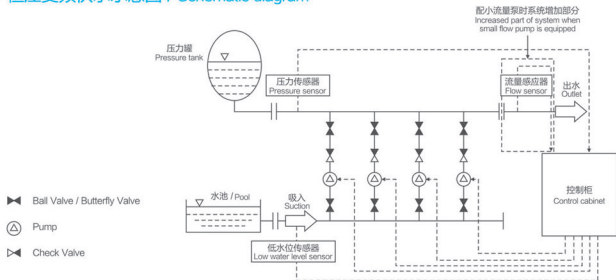


> 工作原理 / Working principle

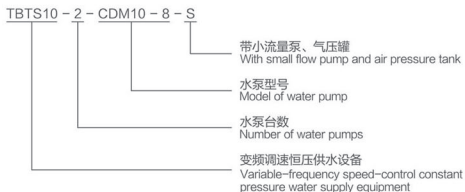
智能型变频恒压供水设备是采用可编程控制器(PLC)对管网出水口的实时压力进行采集,通过PID运算后控制变频调速器调节水泵转速,其主要特点是技术先进,自动化程度高,运行安全可靠,管理维护简单,实现了整个控制系统的智能化工作。设备投入运行前,首先应设定设备的工作压力等相关运行参数,设备运行时,由压力传感器连续采集供水管网中的水压及水压变化率信号,并将其转换为电信号传送给变频控制系统,控制系统将反馈回来的信号与设定压力进行比较和运算,如果实际压力比设定压力低,则发出指令控制水泵加速运行,反之,则控制水泵减速运行,当达到设定压力时,水泵就维持在该运行频率上。如果变频水泵达到了额定转速(频率),经过一定时间的判断后,如果管网压力仍低于设定压力,则控制系统将维持该水泵正常运行,并顺序变频启动下一台水泵,直至管网压力达到设定压力;反之,如果系统用水量减少,则系统指令水泵减速运行,当降低到水泵的有效转速后,则正在运行的水泵中最先启动的水泵停止运行,即减少水泵的运行台数,直至管网压力恒定在设定压力范围内。本系统通过对流量及压力的实时监控,实现高效节能的运行工况。

Our smart variable-frequency constant-pressure water supply equipment adopts programmable logic controller (PLC) to collect the data of real-time pressure at the outlet of pipe network. The variable-frequency speed controller will regulate the rotation speed of water pump through PID calculation. Its main characteristics are adoption of advanced technologies, high degree of atomization, safe and reliable operation and easy management and maintenance which guarantee the intellectualization of the entire control system. Before the equipment is put into operation, the operation parameters i.e. working pressure of equipment shall be set first. During operation, the pressure sensor constantly collects the signals of water pressure of water supply network and change rate of water pressure, converts them to electrical signals and sends them to the variable-frequency control system. The control system will perform comparison and calculation between the feedback signal and the set pressure. If the actual pressure is lower than set pressure, a command is issued to accelerate the speed of water pump. Otherwise, the speed of water pump will be lowered. When the actual pressure reaches the set pressure, the water pump will be maintained at current operation frequency. Where the water pump reaches the rated rotation speed (frequency), if the pipe network pressure is still lower than the set pressure after a certain period of judgment, the control system will maintain the normal operation of the water pump and change the frequency in order to start the next water pump until the pipe network reaches the set pressure. Otherwise, if water consumption of the system is reduced, the system will issue a command to reduce the operation speed of water pump. After it's reduced to the valid rotation speed of water pump, the water pump which is first started among all water pumps in operation will stop running. In this way, the number of water pumps in operation is reduced until the pipe network pressure is constantly maintained within the set pressure. This system will perform real-time monitoring of the flow and pressure to achieve efficient and energy-saving operation.

> 恒压变频供水示意图 / Schematic diagram



> 设备型号意义说明 / Introduction of equipment models



> 使用环境 / Usage environment

控制方式 / Means of control	变频控制 / Variable-frequency control
安装场所 / Installation place	室内 / Indoors
温度环境 / Temperature and environment	+5℃~+40℃
输送液体 / Liquid to be transferred	清水 / Clean water
液体温度 / Liquid temperature	0~70℃
最高使用压力(吸入压力+水泵关死点扬程) Maximum usage pressure (Suction pressure + lift of water pump at dead point)	20kg/cm ²
最小吸入压力 / Minimum suction pressure	0.2kg/cm ²
允许吸入压力 / Allowed suction pressure	受到最高使用压力限制 Restricted by maximum usage pressure
水泵 / Water pump	立式/卧式多级离心泵 Vertical/horizontal multistage centrifugal pump
水泵组合台数 / Number of water pumps in one set	2~6台 (Pumps)
电源 / Power	三相 (Three phase) x220/380Vx50Hz

主要控制功能 / Main control function

功能 / Function	内容 / Content
变频器控制移动方式 Means of control and movement of frequency converter	在菜单内选择变频器控制方式或固定方式 Select the drive control mode or fixed mode in the menu.
LCD液晶显示屏 Liquid Crystal Display (LCD)	利用宽屏LCD画面显示各种信息 Use a widescreen LCD display to display a variety of information
中文LCD显示 Chinese LCD display	操作简单 Easy operation
操作界面选择 Selection of operation interface	中、英文菜单选择 Selection of Chinese and English menu
PLC控制 PLC control	最新的高性能控制系统 Latest high-performance control system
水泵按顺序运行 Operation of water pumps in order	水泵按顺序运行及停止 Operation and shutoff of water pumps in order
防止水泵空转 Prevention of idling of water pump	进水管缺水时水泵停止运转，系统报警 When there is little water at the inlet pipe, the water pump stops operation and the system alarm is triggered.
能越过故障泵运行 Able to operate regardless of faulty pump	水泵发生故障时，系统能自动启动下一个正常泵运行 When there is error of one water pump, the system will automatically start up the next normal water pump.
防止粘住功能 Prevent sticking	系统能自动定期试运转水泵，防止水泵长时间停止造成的粘住 The system will automatically perform put water pumps into trial operation on a regulation basis, so as to prevent the water pumps from sticking due to non-operation for a long period.
防止电机过电流现象 Prevent over-current of motor	防止启动时电机电流超过设定值 Prevent the current of motor going over set value when it's started
防止电机过热 Prevent overheat of motor	利用在电机上的温度开关自动停止水泵 The temperature switch on the motor will shut off water pumps automatically.
防止异常高压 Prevent abnormal high pressure	利用压力传感器能防止压力异常升高 The pressure sensor will prevent the abnormal rise of temperature.
定时运转 Timed operation	按要求设定运转时间，节约能源 Set the duration of operation as per requirements to save energy
自诊断运行 Self-diagnosis operation	具有实时监控功能能诊断出各种故障 The real-time monitoring will diagnose various faults.
高压报警 High pressure alarm	超过设定的压力、设定时间时自动停止水泵并报警 If the pressure or duration of operation is over the set value, the water pump will automatically shut off and triggers alarm.
低压报警 Low pressure alarm	所有水泵工频运行长时间未达到设定压力值时报警 If the working frequency of all water pumps fails to meet the set pressure for a long time, alarm will be triggered.
显示偏差调整 Adjust display deviation	LCD显示运行压力与压力表指示压力值不一致时可调整 If the operation pressure displayed on the LCD is inconsistent with that of piezometer, adjustment is available.
运行内容记录并存储 Record and save the content of operation	各种运行状况记录并保存 Record and save all kinds of operation.
报警内容显示并存储 Display and save the content of alarm	各种报警内容显示并保存 Display and save the content of all kinds of alarm.
应急措施 Emergency measures	变频控制发生故障时可切换到手动控制上 In case of failure of variable-frequency control, it can be switched to manual control.
交替运行 Alternate operation	运转一定时间后主泵自动进行切换运行，实现水泵均匀使用 After certain duration of operation, the main pump will automatically operate alternatively, so that all pumps are operating for an even period of time.
并联组合运行 Operation in parallel combination	最多能并联6台水泵 A maximum of 6 water pumps can be connected in series.

性能参数表 / Table of performance parameters

类别 Category	型号 Type-Model	功率 / Power KW	进水管径 Inlet and outlet pipe diameter	压力罐 (容积: L) Pressure tank (Capacity: L)		流量/Flow m ³ /h	3.6	4.8	6	7.2	8.4	9	9.6
				压力控制 Pressure control	变频控制 Variable-frequency control								
TBT5-3	CDM3-4	0.37	DN50	100	50	扬程 / Lift (m) H	29	28.5	27.5	26	24	23	22
	CDM3-6	0.55	DN50	100	50		43.5	42.5	41	39	36.5	35	33.5
	CDM3-8	0.75	DN50	100	50		58.5	58	56	53	49	47	45
	CDM3-12	1.1	DN50	100	50		88	86	83	79	74	71	67
	CDM3-16	1.5	DN50	100	50		118	116	112	107	100	96	92
	CDM3-20	2.2	DN50	100	50		148	144	140	133	125	120	114
	CDM3-25	3	DN50	100	50		185	181	175	166	156	150	142

类别 Category	型号 Type-Model	功率 / Power KW	进水管径 Inlet and outlet pipe diameter	压力罐 (容积: L) Pressure tank (Capacity: L)		流量/Flow m ³ /h	7.5	9	12	15	18	21	24
				压力控制 Pressure control	变频控制 Variable-frequency control								
TBT5-3	CDM5-5	0.75	DN65	200	50	扬程 / Lift (m) H	35	34.5	33	30	27	23	18
	CDM5-8	1.1	DN65	200	50		57	56	53	49	44	36	28
	CDM5-11	1.5	DN65	200	50		78	77	73	68	61	51	39
	CDM5-14	2.2	DN65	200	50		100	98	93	87	77	65	51
	CDM5-17	3	DN65	200	50		121	118.5	113	105	94	79	62
	CDM5-21	3	DN65	200	50		150	147	140	130	116	98	77
	CDM5-24	4	DN65	200	50		172	168	160	149	133	113	90

类别 Category	型号 Type-Model	功率 / Power KW	进水管径 Inlet and outlet pipe diameter	压力罐 (容积: L) Pressure tank (Capacity: L)		流量/Flow m ³ /h	12	15	18	24	30	36	42
				压力控制 Pressure control	变频控制 Variable-frequency control								
TBT10-3	CDM10-3	1.1	DN80	200	80	扬程 / Lift (m) H	33.3	31.5	31	28.5	25.5	22	16.5
	CDM10-4	1.5	DN80	200	80		44.5	42	41	38	34	29	22
	CDM10-6	2.2	DN80	200	80		67	63	62	58	52	44	34
	CDM10-8	3	DN80	200	80		90	85	84	79	71	60	46
	CDM10-11	4	DN80	200	80		124	118	115	108	98	84	64
	CDM10-15	5.5	DN80	200	80		171	162	159	149	134	114	88
	CDM10-19	7.5	DN80	200	80		217	206	201	190	172	147	113

类别 Category	型号 Type-Model	功率 / Power KW	进水管径 Inlet and outlet pipe diameter	压力罐 (容积: L) Pressure tank (Capacity: L)		流量/Flow m ³ /h	24	30	36	42	45	48	54
				压力控制 Pressure control	变频控制 Variable-frequency control								
TBT15-3	CDM15-1	1.1	DN100	300	100	扬程 / Lift (m) H	12.2	12	11.8	11.5	11	10.5	10
	CDM15-2	2.2	DN100	300	100		24.5	24	23.5	23	22.5	21.5	20
	CDM15-3	3	DN100	300	100		37.5	37	36.5	35.5	34.5	34	32
	CDM15-5	4	DN100	300	100		63	62	61	59	58	57	53
	CDM15-7	5.5	DN100	300	100		89	88	86	83	81	79	74
	CDM15-9	7.5	DN100	300	100		115	113	111	108	106	103	96
	CDM15-12	11	DN100	300	100		154	152	149	145	142	138	129
	CDM15-15	15	DN100	300	100		196	192	188	182	178	173	161

类别 Category	型号 Type-Model	功率 / Power KW	进水管径 Inlet and outlet pipe diameter	压力罐 (容积: L) Pressure tank (Capacity: L)		流量/Flow m ³ /h	30	36	42	48	54	60	66
				压力控制 Pressure control	变频控制 Variable-frequency control								
TBT20-3	CDM20-1	1.1	DN100	400	150	扬程 / Lift (m) H	12.5	12.3	12	11.5	11	10.5	10
	CDM20-2	2.2	DN100	400	150		25.5	25	24.5	24	23.7	23	22
	CDM20-3	4	DN100	400	150		39.5	39	38	37	36	35	33
	CDM20-4	5.5	DN100	400	150		52.5	51	50	49	48.5	47	45
	CDM20-6	7.5	DN100	400	150		79	78	77	75	73	70	66
	CDM20-10	11	DN100	400	150		133	132	130	127	123	119	113
	CDM20-14	15	DN100	400	150		187	185	183	179	174	168	160
	CDM20-17	18.5	DN100	400	150		228	225	222	218	212	205	195

类别 Category	型号 Type-Model	功率/Power KW	进水管径 inlet and outlet pipe diameter	压力罐 (容积: L) Pressure tank (Capacity: L)		流量/F/kw m ³ /h	48	60	72	84	96	108	120
				压力控制 Pressure control									
				变频控制 Variable frequency control									
TBTS32-3	CDM32-10-1	1.5	DN125	500	200	扬程 / Lift (m) H	14	13	12	11	9	7	4
	CDM32-10	2.2	DN125	500	200		18	17	15	14	13	11	8
	CDM32-20-2	3	DN125	500	200		29	28	26	23	20	16	11
	CDM32-20	4	DN125	500	200		36	34	32	29	27	23	18
	CDM32-30	5.5	DN125	500	200		54	51	48	44	40	35	27
	CDM32-40	7.5	DN125	500	200		72	69	65	59	53	47	37
	CDM32-60	11	DN125	500	200		108	104	97	90	81	72	57
	CDM32-70	15	DN125	500	200		126	121	113	105	95	85	67
	CDM32-90	18.5	DN125	500	200		162	156	147	136	124	109	88
	CDM32-110	22	DN125	500	200		200	191	180	168	153	135	109
CDM32-130	30	DN125	500	200	237	225	213	200	181	160	131		

类别 Category	型号 Type-Model	功率/Power KW	进水管径 inlet and outlet pipe diameter	压力罐 (容积: L) Pressure tank (Capacity: L)		流量/F/kw m ³ /h	75	90	105	120	126	135	150
				压力控制 Pressure control									
				变频控制 Variable frequency control									
TBTS42-3	CDM42-10-1	3	DN150	500	200	扬程 / Lift (m) H	20	19	18	17	16	15	13
	CDM42-10	4	DN150	500	200		24	23	22	21	20	19	18
	CDM42-20-2	5.5	DN150	500	200		40	38	36	33	32	30	27
	CDM42-20	7.5	DN150	500	200		48	46	44	42	41	39	35
	CDM42-30	11	DN150	500	200		71	69	66	63	61	58	53
	CDM42-40	15	DN150	500	200		95	92	88	84	81	78	71
	CDM42-50	18.5	DN150	500	200		119	115	110	105	101	97	88
	CDM42-60	22	DN150	500	200		143	138	132	125	122	116	106
	CDM42-70	30	DN150	500	200		166	161	154	146	142	135	124
	CDM42-80	30	DN150	500	200		190	184	176	167	162	154	141
CDM42-90	37	DN150	500	200	214	207	198	188	183	174	159		

类别 Category	型号 Type-Model	功率/Power KW	进水管径 inlet and outlet pipe diameter	压力罐 (容积: L) Pressure tank (Capacity: L)		流量/F/kw m ³ /h	90	120	150	180	195	210	240
				压力控制 Pressure control									
				变频控制 Variable frequency control									
TBTS65-3	CDM65-10-1	4	DN250	500	200	扬程 / Lift (m) H	19	18	16	14	13	11	8
	CDM65-10	5.5	DN250	500	200		27	25	23	21	20	18	15
	CDM65-20-2	7.5	DN250	500	200		39	36	33	29	26	23	17
	CDM65-20-1	11	DN250	500	200		46	44	40	36	33	30	24
	CDM65-30-2	15	DN250	500	200		66	62	56	50	46	41	32
	CDM65-30	18.5	DN250	500	200		80	76	70	64	60	55	46
	CDM65-40-1	22	DN250	500	200		100	94	87	78	73	67	54
	CDM65-50-2	30	DN250	500	200		121	114	105	95	88	80	64
	CDM65-50	30	DN250	500	200		136	129	119	109	102	94	78
	CDM65-60	37	DN250	500	200		164	156	145	132	124	115	95
CDM65-70-1	37	DN250	500	200	186	176	163	148	139	128	106		

类别 Category	型号 Type-Model	功率/Power KW	进水管径 inlet and outlet pipe diameter	压力罐 (容积: L) Pressure tank (Capacity: L)		流量/F/kw m ³ /h	150	180	210	240	255	270	300
				压力控制 Pressure control									
				变频控制 Variable frequency control									
TBTS85-3	CDM85-10-1	5.5	DN300	600	250	扬程 / Lift (m) H	22	19	17	16	14	13	10
	CDM85-10	7.5	DN300	600	250		25	24	22	21	20	19	16
	CDM85-20-2	11	DN300	600	250		41	39	36	32	30	28	22
	CDM85-20	15	DN300	600	250		53	50	47	44	41	40	36
	CDM85-30-2	18.5	DN300	600	250		68	65	60	55	52	49	41
	CDM65-30	22	DN300	600	250		81	77	72	67	64	62	55
	CDM85-40-2	30	DN300	600	250		98	93	87	80	75	72	62
	CDM85-40	30	DN300	600	250		110	105	100	92	86	84	76
	CDM85-50-2	37	DN300	600	250		126	120	113	104	98	93	81
	CDM85-50	37	DN300	600	250		139	131	124	115	110	106	94
CDM85-60-2	45	DN300	600	250	155	148	139	129	122	117	102		