



# Synchro and Resolver Conversion

## Appendix A

### Appendix A

#### Synchro Control Transmitters (CX)

TYPE DESIGNATION	FREQ Hz	RATED VOLTS	PRIMARY (ROTOR)				SECONDARY (STATOR)			NOMINAL IMPEDANCE				STATOR ERROR (mins)	RESIDUAL	
			NO LOAD INPUT			D.C. RESIST- ANCE (ohms)	NO LOAD OUTPUT		D.C. RESIST- ANCE (ohms)	Z <sub>ro</sub> (ohms)	Z <sub>rs</sub> (ohms)	Z <sub>so</sub> (ohms)	Z <sub>ss</sub> (ohms)		Fund (mV)	Total (mV)
			volts	amps (max)	watts (max)		volts	Phase lead (deg)								
26V 08CX4(B1)	400	26	26	0.111	0.95	60	11.8	13.0	19	77+j270	137+j39	17+j49	-	10	20	40
26V 06CX4c	400	26	26	0.153	0.86	26	11.8	8.0	10	32+j185	70+j23	9+j32	12.5+j2.7	7	20	30
26V 11CX4c	400	26	26	0.130	0.56	21	11.8	4.5	20.6	34+j265	51+j21	7.7+j45	8.7+j3.2	7	12	19
11CX4e	400	115	115	0.031	0.61	343	90	4.5	300	550+j4070	725+j307	330+j2080	387+j147	7	45	75
15CX4d	400	115	115	0.085	1.41	97	90	3.6	86	179+j1400	217-j1125	100+j775	112+j63	6	32	60
15CX6b	60	115	115	0.056	2.4	550	90	15.0	470	628+j2210	1170+j299	367+j1190	630+j143	7	75	110
18CX4d	400	115	115	0.110	1.32	25	90	1.0	37	78+j2210	78+j81	52+j598	40+j39	6	40	60
18CX6e	60	115	115	0.040	1.11	559	90	10.0	666	605+j3130	1380+j451	510+j1580	740+j150	8	30	85
23CX4d	400	115	115	0.245	2.95	15.5	90	1.8	11.8	31+j530	31+j36	15+j263	15.7+j17.7	6	32	48
23CX6d	60	115	115	0.080	1.74	195	90	6.0	276	242+j1650	462+j150	211+j954	319+j62	8	30	60

#### Synchro Control Transformers (CT)

TYPE DESIGNATION	FREQ Hz	RATED VOLTS	PRIMARY (ROTOR)				SECONDARY (STATOR)			NOMINAL IMPEDANCE				STATOR ERROR (mins)	RESIDUAL		
			NO LOAD INPUT			D.C. RESIST- ANCE (ohms)	NO LOAD OUTPUT		VOLTAGE GRADIENT (volts/deg)	D.C. RESIST- ANCE (ohms)	Z <sub>ro</sub> (ohms)	Z <sub>rs</sub> (ohms)	Z <sub>so</sub> (ohms)		Z <sub>ss</sub> (ohms)	Fund (mV)	Total (mV)
			volts	amps (max)	watts (max)		volts	Phase lead (deg)									
26V 08CT4(B1)	400	11.8	10.2	0.137	0.47	28	22.5	13.5	0.39	145	173+j564	253+j104	25+j93	-	10	30	60
26V 08CT4c	400	11.8	10.2	0.023	0.057	99	22.5	8.5	0.39	423	607+j2900	800+j300	100+j506	140+j53	7	25	30
26V 11CT4d	400	11.8	10.2	0.086	0.184	16.7	22.5	6.0	0.39	87	130+j716	151+j73.5	20+j128	27+j13.8	7	15	18
11CT4e	400	90	78	0.018	0.31	529	57.3	4.5	1.0	347	510+j3020	535+j302	700+j4900	900+j515	7	32	60
15CT4c	400	90	78	0.010	0.165	897	57.3	4.2	1.0	589	837+j5170	943+j589	1020+j8330	1500+j982	6	32	60
15CT6d	60	90	78	0.013	0.21	1300	57.3	9.5	1.0	900	970+j3800	1430+j409	1140+j6240	2280+j836	6	45	65
18CT4c	400	90	78	0.007	0.07	863	57.3	2.5	1.0	367	800+j7770	745+j782	1360+j12600	1240+j1250	6	20	30
18CT6d	60	90	78	0.017	0.45	2140	57.3	18.0	1.0	1030	1050+j3280	1880+j611	1690+j4800	2830+j848	6	25	45
23CT4c	400	90	78	0.0057	0.071	730	57.3	2.0	1.0	330	750+j8570	660+j812	1230+j14300	1100+j1360	6	20	45
23CT6d	60	90	78	0.0185	0.5	1830	57.3	14.0	1.0	800	883+j3080	1500+j512	1380+j4790	2370+j791	6	30	45

FIG. A-1 COMMON SYNCHRO PARAMETERS.

Appendix A

COMMON SYNCHRO PARAMETERS  
Appendix A

### Synchro Control Differential Transmitters (CDX)

TYPE DESIGNATION	FREQ Hz	RATED VOLTS	PRIMARY (ROTOR)				SECONDARY (STATOR)				NOMINAL IMPEDANCE				ERROR		RESIDUAL	
			NO LOAD INPUT			D.C. RESIST- ANCE	NO LOAD OUTPUT			D.C. RESIST- ANCE	Z <sub>m</sub>	Z <sub>rs</sub>	Z <sub>ss</sub>	Z <sub>ss</sub>	STATOR	ROTOR	Fund	Totd
			volts	amps (max)	watts (max)	(ohms)	volts	Phase lead (deg)	(ohms)	(ohms)	(ohms)	(ohms)	(mins)	(mins)	(mV)	(mV)		
26V 08CDX4(D1)	400	11.8	10.2	0.200	0.800	19	11.8	13.0	34	-	-	20+j56	-	10	10	30	60	
26V 08CDX4c	400	11.8	10.2	0.108	0.300	24	11.8	9.5	36	33+j124	46+j14	24+j108	39+j14	7	7	20	30	
26V 11CDX4c	400	11.8	10.2	0.150	0.340	10.6	11.8	5.7	16.6	17.6+j86	20.7+j67	12.2+j75	17.5+j8.5	7	7	17	26	
11CDX4b	400	90	78	0.049	0.730	191	90	4.7	446	450+j1930	487+j200	242+j1690	421+j211	7	7	60	90	
15CDX4d	400	90	78	0.090	1.340	10	90	5.2	139	159+j1060	190+j125	129+j917	164+j111	6	6	32	60	
15CDX6c	60	90	78	0.038	0.630	515	90	10.0	960	780+j2625	1114+j2270	435+j2270	930+j880	7	7	60	100	
18CDX4c	400	90	78	0.128	1.210	47	90	3.0	46	65+j669	72+j71	63+j623	65+j64	6	6	40	75	
18CDX6d	60	90	78	0.052	1.450	599	90	17.0	897	717+j1850	1130+j315	465+j1490	885+j308	7	7	60	100	
23CDX4c	400	90	78	0.285	2.900	18	90	3.0	19	26+j310	27+j30	24+j280	24.7+j27.2	7	7	30	60	
23CDX6c	60	90	78	0.090	1.820	255	90	11.0	315	-	453+j147	214+j947	-	8	8	40	65	

### Synchro Torque Transmitters (TX)

TYPE DESIGNATION	FREQ Hz	RATED VOLTS	PRIMARY (ROTOR)				SECONDARY (STATOR)				NOMINAL IMPEDANCE				ERROR	RESIDUAL		MINIMUM TORQUE GRADIENT per degree per gm.cm.	MAXIMUM CONTINUOUS		PULL OUT TORQUE (gm.cm.)
			NO LOAD INPUT			D.C. RESIST- ANCE	NO LOAD OUTPUT			D.C. RESIST- ANCE	Z <sub>m</sub>	Z <sub>rs</sub>	Z <sub>ss</sub>	Z <sub>ss</sub>	STATOR	Fund	Totd		TORQUE (gm.cm.)	DISPLACEMENT (degrees)	
			volts	amps (max)	watts (max)	(ohms)	volts	Phase lead (deg)	(ohms)	(ohms)	(ohms)	(ohms)	(mins)	(mV)	(mV)						
26V 11TX4c	400	26	26	0.280	1.00	7.8	11.8	38	2.8	13.7+j114	19.4+j8.7	3.1+j19.4	3.3+j1.3	7	-	-	0.55	25	38	40	
11TX4b	400	115	115	0.060	1.08	163	90	6	148	285+j2140	370+j159	175+j1090	191+j76	7	-	-	0.61	25	38	40	
15TX4b	400	115	115	0.200	3.10	37.5	90	2.5	40	100+j955	96+j68	65+j493	48+j33	6	120	220	2.2	22	10	85	
18TX6a	60	115	115	0.105	4.00	245	90	14	300	335+j1270	686+j210	256+j916	379+j81	6	-	-	3.6	134	37	172	
23TX4b	400	115	115	0.719	6.50	2.3	90	1	2.6	15.5+j192	10.8+j10.6	7.5+j98	5.1+j5.0	6	-	-	18	290	16	1380	
23TX6b	60	115	115	0.230	6.00	75	90	7	103	96+j738	210+j63	78+j445	106+j24	8	-	-	8.6	475	44	700	

FIG. A-2 SYNCHRO CONTROL DIFFERENTIAL TRANSMITTERS AND SYNCHRO TORQUE TRANSMITTERS.



# Synchro and Resolver Conversion

## Appendix A

### Synchro Torque Receivers (TR)

TYPE DESIGNATION	FREQ Hz	PRIMARY (ROTOR)						SECONDARY (STATOR)				ERROR		MINIMUM TORQUE GRADIENT per degree per gm.cm.	MAXIMUM CONTINUOUS		PULL OUT TORQUE (gm.cm.)	SYNCHRO- NISING TIME				
		RATED VOLTS	NO LOAD INPUT			D.C. RESIST- ANCE (ohms)	NO LOAD OUTPUT		D.C. RESIST- ANCE (ohms)	NOMINAL IMPEDANCE					STATOR (mins)	RECEIVER (mins)		TORQUE (gm.cm.)	DISPLACEMEN (degrees)	TORQUE (gm.cm.)	30 deg secs	175 deg secs
			volts	amps (max)	watts (max)		volts	Phase (deg)		Z <sub>ro</sub> (ohms)	Z <sub>rs</sub> (ohms)	Z <sub>so</sub> (ohms)	Z <sub>ss</sub> (ohms)									
28V 11TR4b	400	26	26	0.280	1.10	7.8	11.8	3.8	2.8	13.7+j114	19.4+j8.7	3.1+j19.4	3.3+j1.3	7	60	0.61	25	38	40	1.5	2.5	
11TR4h	400	115	115	0.060	1.08	163	90	6.0	148	285+j2140	370+j159	175+j1080	191+j76	7	60	0.61	25	38	40	1.5	2.5	
15TR4c	400	115	115	0.190	3.40	37.5	90	2.5	40	100+j995	96+j68	65+j493	44+j33	6	45	2.20	22	10	85	1	2	
15TR6a	60	115	115	0.200	3.10	400	90	13.0	240	502+j2240	885+j194	301+j1400	509+j106	6	45	2.20	70	33	95	1	2	
18TR4h	400	115	115	0.430	4.00	9.5	90	1.5	10.5	25+j370	25+j25	16+j180	12+j12	5	45	7.20	104	12	455	1	2	
23TR4b	400	115	115	0.719	6.50	2.3	90	1.0	2.6	15.5+j192	10.8+j10.6	7.5+j98	5.1+j5.0	6	45	18.00	290	16	1300	1	2	

FIG. A-3 SYNCHRO TORQUE RECEIVERS.