

MODELS: FR-D840 (0.4K-012 to 15K-295)

**TITLE: SIMULATION DATA OF LOAD FACTOR VERSUS INPUT POWER FACTOR, THDi and THDv WHEN
USED WITH REACTOR**

The following is simulation data of input power factor and THDi , THDv versus load factor.

Simulation conditions

Inverter:	FR-D840-0.4K-012 to FR-D840-15K-295
Input voltage	400V
Input frequency:	50Hz
Output frequency	50Hz
Power supply capacity:	500kVA (without reactor) 1000kVA (with reactor)
Impedance of power supply	5%
Length of input cable	10m
Reactor:	FR-HEL connected FR-HAL+FR-HEL connected Without reactor

Simulation result

Input power factor

- Refer to the table1.1 and Table1.2

THDi characteristics

- Refer to the Table2.1 and Table2.2

THDv characteristics

- refer to the table3.1 and table3.2

MODELS: FR-D840 (0.4K-012 to 15K-295)

Table 1.1 Load factor - input power factor characteristics [ND rating]

Model FR-D840- []	FR-HEL connected				FR-HAL + FR-HEL connected				Without reactor			
	Load factor [ND rating]				Load factor [ND rating]				Load factor [ND rating]			
	25%	50%	75%	100%	25%	50%	75%	100%	25%	50%	75%	100%
0.4K-012	76%	89%	92%	94%	85%	92%	94%	94%	52%	55%	58%	59%
0.75K-022	76%	89%	93%	94%	85%	92%	93%	94%	53%	57%	60%	62%
1.5K-037	75%	88%	92%	94%	83%	91%	93%	94%	54%	58%	60%	62%
2.2K-050	75%	88%	92%	94%	83%	91%	93%	94%	55%	59%	61%	63%
3.7K-081	75%	88%	92%	94%	83%	91%	93%	94%	57%	62%	64%	66%
5.5K-120	75%	88%	92%	94%	83%	91%	93%	94%	56%	60%	63%	65%
7.5K-163	75%	88%	92%	94%	83%	91%	93%	94%	58%	63%	65%	67%
11K-230	75%	88%	92%	93%	83%	91%	93%	94%	57%	62%	65%	66%
15K-295	76%	88%	92%	94%	83%	91%	93%	94%	57%	62%	65%	67%

Table 1.2 Load factor - input power factor characteristics [SLD rating]

Model FR-D840- []	FR-HEL connected				FR-HAL + FR-HEL connected				Without reactor			
	Load factor [SLD rating]				Load factor [SLD rating]				Load factor [SLD rating]			
	25%	50%	75%	100%	25%	50%	75%	100%	25%	50%	75%	100%
0.4K-012	70%	76%	84%	89%	75%	85%	90%	92%	52%	55%	58%	59%
0.75K-022	70%	75%	83%	88%	73%	84%	89%	91%	53%	57%	60%	62%
1.5K-037	72%	80%	88%	91%	76%	88%	91%	93%	54%	58%	60%	62%
2.2K-050	71%	77%	86%	90%	75%	86%	90%	92%	55%	59%	61%	63%
3.7K-081	72%	81%	88%	91%	76%	88%	91%	93%	57%	62%	64%	66%
5.5K-120	73%	83%	89%	92%	77%	89%	92%	93%	57%	61%	64%	66%
7.5K-163	72%	81%	88%	91%	76%	88%	91%	93%	57%	61%	64%	66%
11K-230	73%	83%	89%	92%	77%	89%	92%	93%	58%	62%	65%	67%
15K-295	73%	85%	90%	93%	77%	89%	92%	93%	58%	62%	65%	67%

MODELS: FR-D840 (0.4K-012 to 15K-295)

Table 2.1 Load factor - THDi characteristics [ND rating]

Model FR-D840- []	FR-HEL connected				FR-HAL + FR-HEL connected				Without reactor			
	Load factor [ND rating]				Load factor [ND rating]				Load factor [ND rating]			
	25%	50%	75%	100%	25%	50%	75%	100%	25%	50%	75%	100%
0.4K-012	80.3%	50.2%	40.1%	35.7%	57.6%	39.2%	33.4%	30.8%	165%	151%	141%	135%
0.75K-022	81.5%	49.1%	39.4%	35.3%	58.2%	39.0%	33.5%	30.8%	159%	142%	133%	127%
1.5K-037	84.7%	53.0%	41.7%	36.7%	63.1%	41.4%	35.0%	31.7%	155%	140%	132%	126%
2.2K-050	84.2%	52.8%	41.5%	36.7%	62.9%	41.5%	35.0%	31.7%	152%	136%	128%	122%
3.7K-081	82.2%	51.1%	40.7%	36.3%	61.5%	40.7%	34.6%	31.5%	143%	126%	117%	111%
5.5K-120	83.3%	52.3%	41.3%	36.6%	62.9%	41.1%	35.0%	31.8%	146%	131%	122%	116%
7.5K-163	82.1%	51.4%	40.8%	36.4%	61.6%	40.6%	34.5%	31.5%	139%	123%	114%	108%
11K-230	82.5%	51.8%	41.0%	36.6%	62.3%	41.0%	34.8%	31.7%	142%	126%	117%	111%
15K-295	81.9%	51.3%	40.7%	36.5%	61.6%	40.7%	34.5%	31.6%	141%	125%	116%	111%

Table 2.2 Load factor - THDi characteristics [SLD rating]

Model FR-D840- []	FR-HEL connected				FR-HAL + FR-HEL connected				Without reactor			
	Load factor [SLD rating]				Load factor [SLD rating]				Load factor [SLD rating]			
	25%	50%	75%	100%	25%	50%	75%	100%	25%	50%	75%	100%
0.4K-012	97.5%	81.6%	61.0%	49.7%	83.8%	58.3%	45.3%	39.1%	164%	150%	140%	135%
0.75K-022	99.5%	82.9%	63.1%	51.1%	87.6%	61.1%	47.4%	40.4%	159%	143%	133%	127%
1.5K-037	92.6%	70.6%	52.2%	43.8%	80.4%	51.4%	41.0%	36.2%	156%	140%	132%	125%
2.2K-050	95.5%	77.3%	56.7%	47.0%	83.1%	55.4%	43.6%	38.0%	153%	137%	128%	122%
3.7K-081	91.4%	68.1%	50.7%	42.9%	80.0%	50.7%	40.4%	36.1%	143%	127%	117%	112%
5.5K-120	90.0%	64.1%	48.4%	41.3%	77.2%	48.3%	38.9%	34.8%	144%	128%	119%	113%
7.5K-163	91.6%	68.8%	51.2%	43.1%	80.1%	50.7%	40.5%	36.1%	144%	128%	120%	114%
11K-230	89.7%	63.3%	47.9%	40.9%	76.6%	47.9%	38.7%	34.7%	141%	126%	117%	111%
15K-295	87.7%	59.2%	45.6%	39.4%	76.6%	47.9%	38.7%	34.7%	141%	126%	117%	111%

MODELS: FR-D840 (0.4K-012 to 15K-295)

Table 3.1 Load factor - THDv characteristics [ND rating]

Model FR-D840- []	FR-HEL connected				FR-HAL + FR-HEL connected				Without reactor			
	Load factor [ND rating]				Load factor [ND rating]				Load factor [ND rating]			
	25%	50%	75%	100%	25%	50%	75%	100%	25%	50%	75%	100%
0.4K-012	0.03%	0.03%	0.20%	0.20%	0.02%	0.03%	0.05%	0.05%	0.11%	0.18%	0.25%	0.30%
0.75K-022	0.05%	0.21%	0.21%	0.21%	0.04%	0.05%	0.08%	0.09%	0.17%	0.29%	0.38%	0.42%
1.5K-037	0.09%	0.24%	0.24%	0.24%	0.08%	0.11%	0.15%	0.15%	0.30%	0.45%	0.62%	0.80%
2.2K-050	0.26%	0.26%	0.27%	0.27%	0.11%	0.16%	0.22%	0.22%	0.45%	0.68%	0.92%	1.06%
3.7K-081	0.32%	0.33%	0.33%	0.62%	0.18%	0.25%	0.35%	0.40%	0.63%	0.88%	1.28%	1.43%
5.5K-120	0.30%	0.32%	0.32%	0.61%	0.16%	0.23%	0.32%	0.32%	0.50%	0.84%	1.10%	1.38%
7.5K-163	0.36%	0.37%	0.63%	0.63%	0.21%	0.30%	0.42%	0.48%	0.74%	1.20%	1.55%	1.91%
11K-230	0.36%	0.38%	0.63%	0.63%	0.22%	0.31%	0.43%	0.49%	0.69%	0.98%	1.43%	1.62%
15K-295	0.37%	0.39%	0.64%	0.64%	0.23%	0.32%	0.44%	0.50%	0.70%	1.02%	1.47%	1.66%

Table 3.2 Load factor - THDv characteristics [SLD rating]

Model FR-D840- []	FR-HEL connected				FR-HAL + FR-HEL connected				Without reactor			
	Load factor [SLD rating]				Load factor [SLD rating]				Load factor [SLD rating]			
	25%	50%	75%	100%	25%	50%	75%	100%	25%	50%	75%	100%
0.4K-012	0.03%	0.05%	0.21%	0.21%	0.03%	0.04%	0.05%	0.06%	0.09%	0.17%	0.20%	0.23%
0.75K-022	0.06%	0.23%	0.23%	0.23%	0.06%	0.08%	0.08%	0.11%	0.16%	0.27%	0.35%	0.38%
1.5K-037	0.11%	0.26%	0.26%	0.27%	0.09%	0.12%	0.16%	0.17%	0.29%	0.44%	0.61%	0.78%
2.2K-050	0.18%	0.33%	0.34%	0.34%	0.13%	0.19%	0.25%	0.28%	0.45%	0.68%	0.92%	1.05%
3.7K-081	0.25%	0.42%	0.42%	0.65%	0.20%	0.27%	0.36%	0.40%	0.62%	0.87%	1.27%	1.41%
5.5K-120	0.21%	0.37%	0.37%	0.63%	0.21%	0.23%	0.30%	0.42%	0.54%	0.91%	1.18%	1.48%
7.5K-163	0.22%	0.38%	0.38%	0.63%	0.17%	0.24%	0.31%	0.35%	0.56%	0.95%	1.25%	1.57%
11K-230	0.29%	0.46%	0.67%	0.67%	0.28%	0.40%	0.40%	0.56%	0.70%	1.00%	1.46%	1.64%
15K-295	0.40%	0.44%	0.66%	0.66%	0.28%	0.40%	0.40%	0.56%	0.70%	1.00%	1.46%	1.64%

MODELS: FR-D840 (0.4K-012 to 15K-295)

1. Simulation result of FR-D840-0.4K-012 [ND rating]

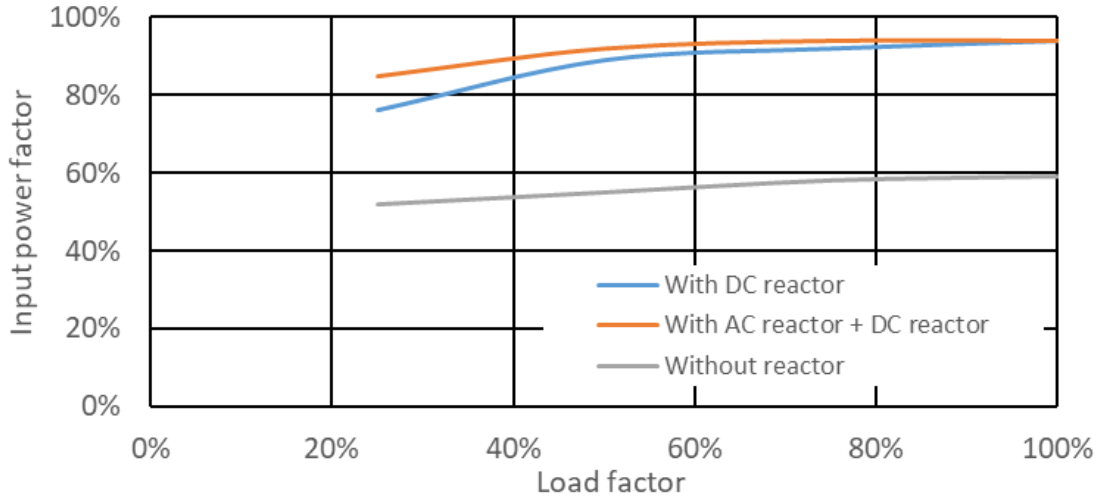


Figure1.1 Load factor - input power factor characteristics

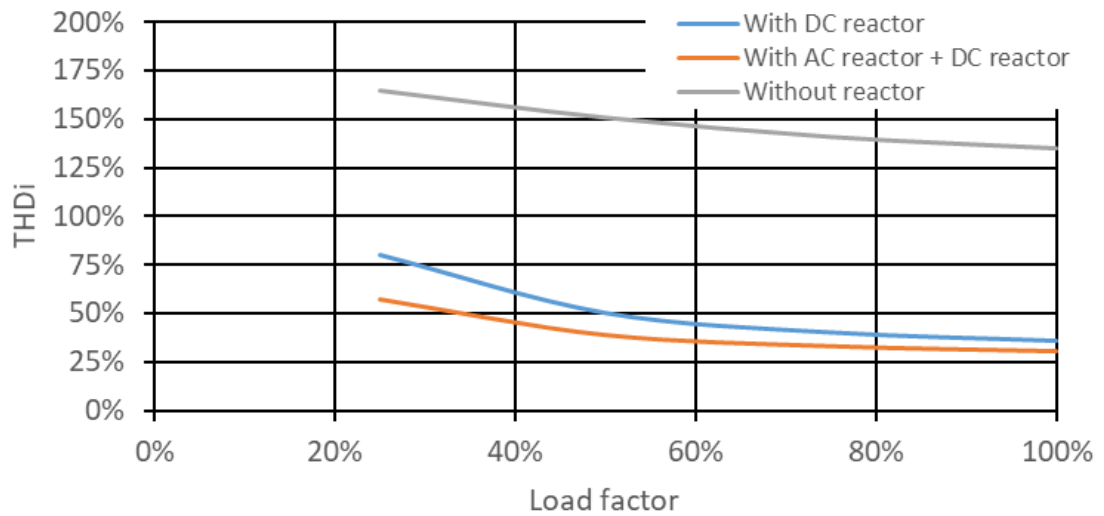


Figure1.2 Load factor - THDi characteristics

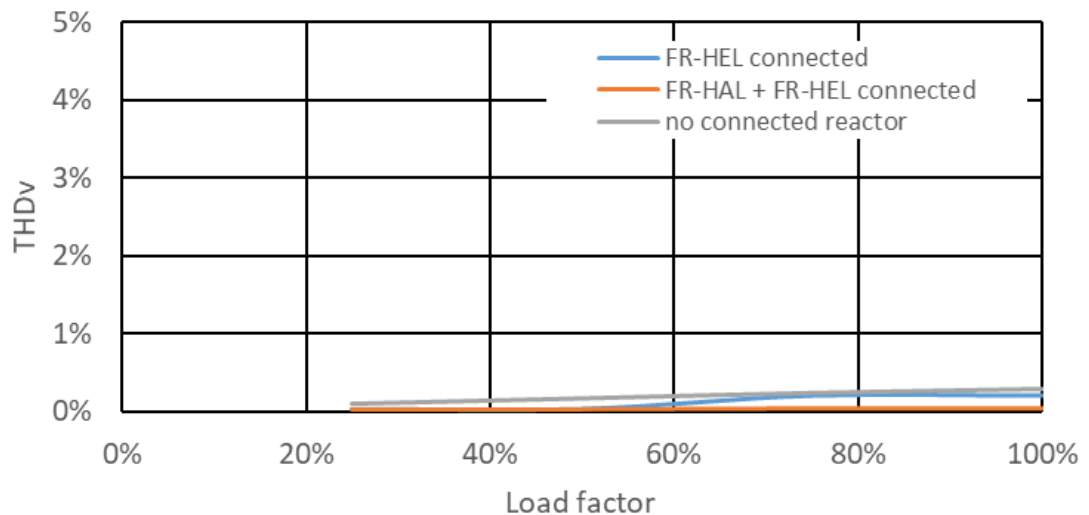


Figure1.3 Load factor - THDv characteristics

MODELS: FR-D840 (0.4K-012 to 15K-295)

2. Simulation result of FR-D840-0.75K-022 [ND rating]

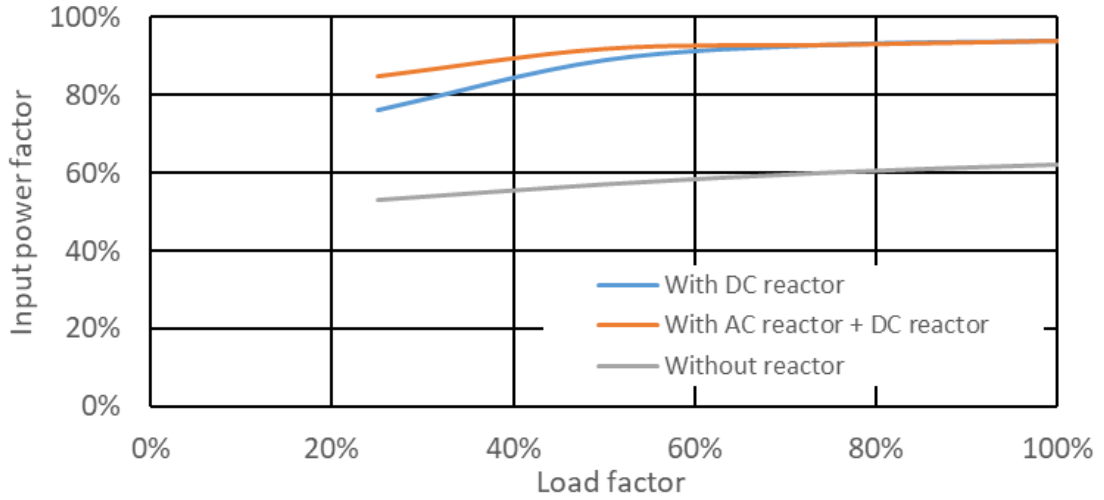


Figure2.1 Load factor - input power factor characteristics

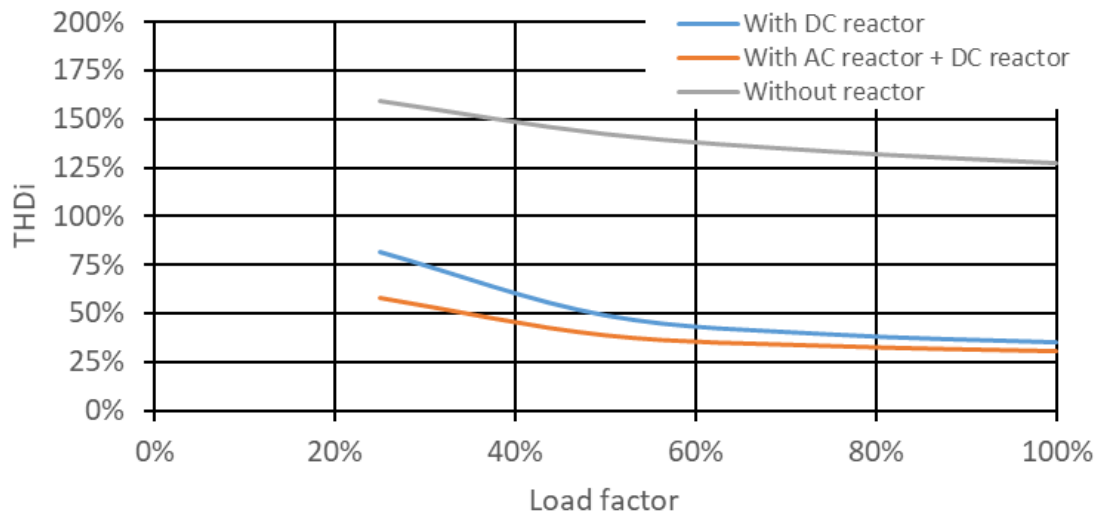


Figure2.2 Load factor - THDi characteristics

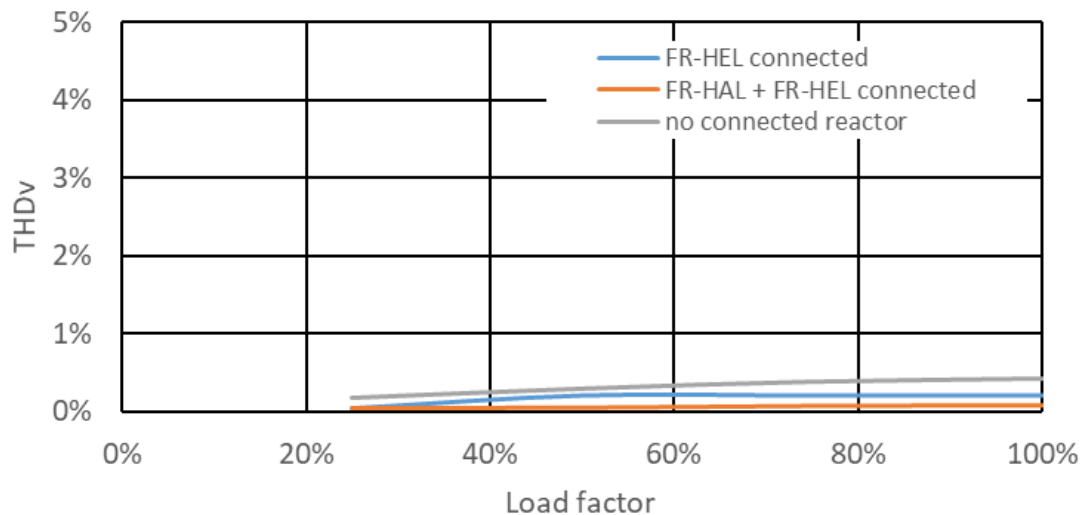


Figure2.3 Load factor - THDv characteristics

MODELS: FR-D840 (0.4K-012 to 15K-295)

3. Simulation result of FR-D840-1.5K-037 [ND rating]

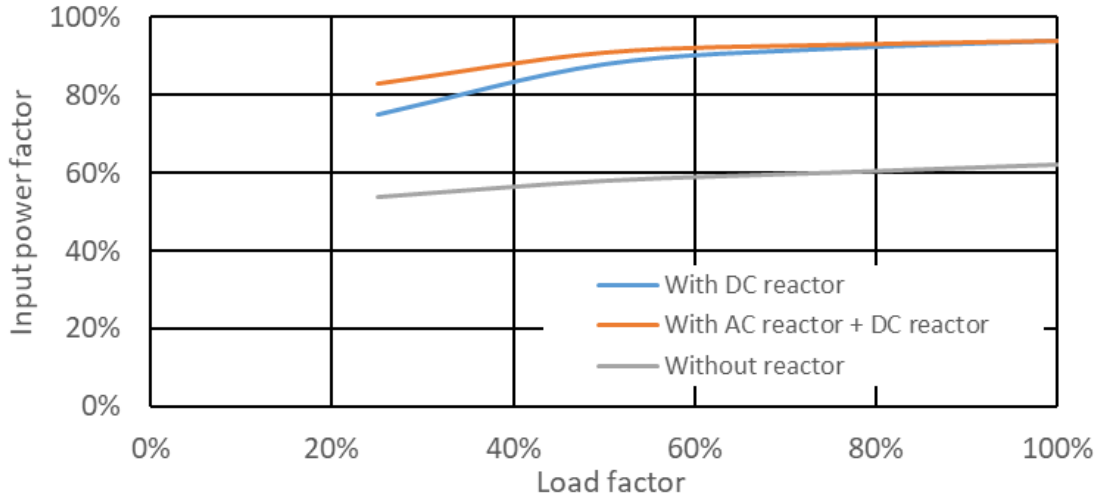


Figure3.1 Load factor - input power factor characteristics

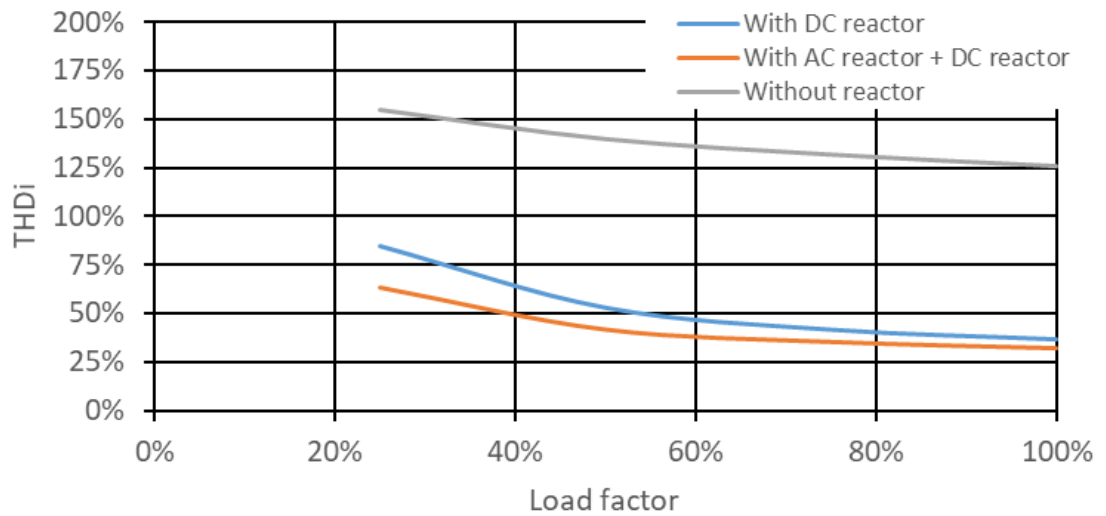


Figure3.2 Load factor - THDi characteristics

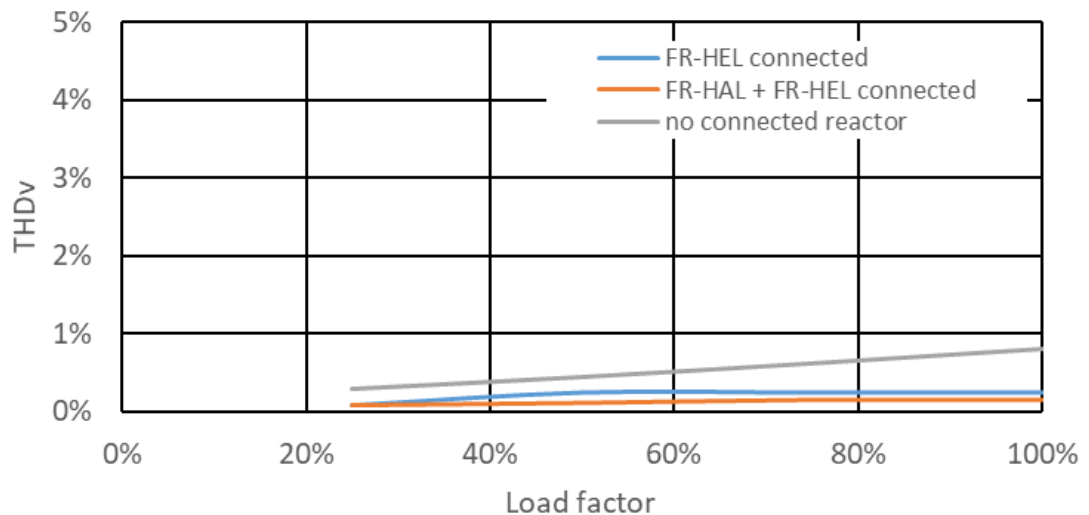


Figure3.3 Load factor - THDv characteristics

MODELS: FR-D840 (0.4K-012 to 15K-295)

4. Simulation result of FR-D840-2.2K-050 [ND rating]

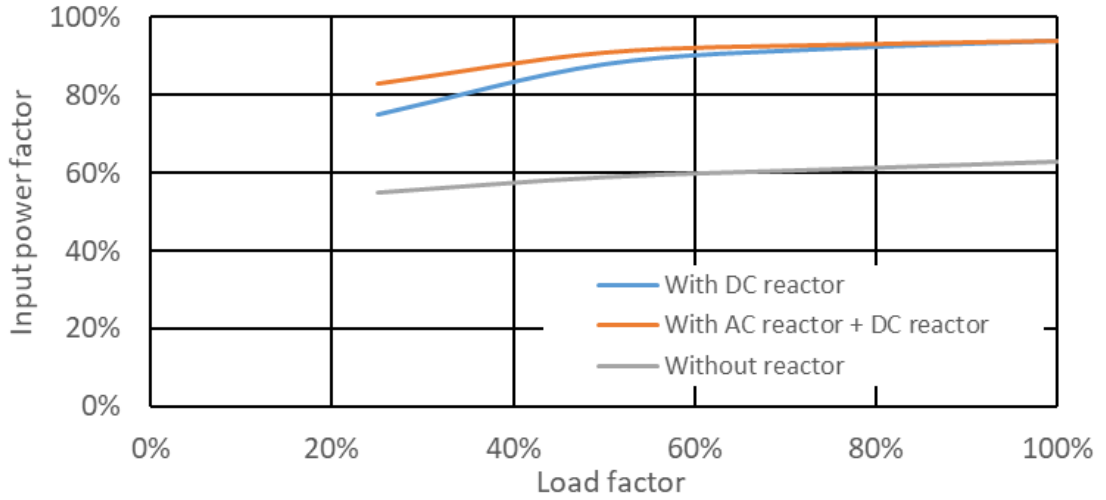


Figure4.1 Load factor - input power factor characteristics

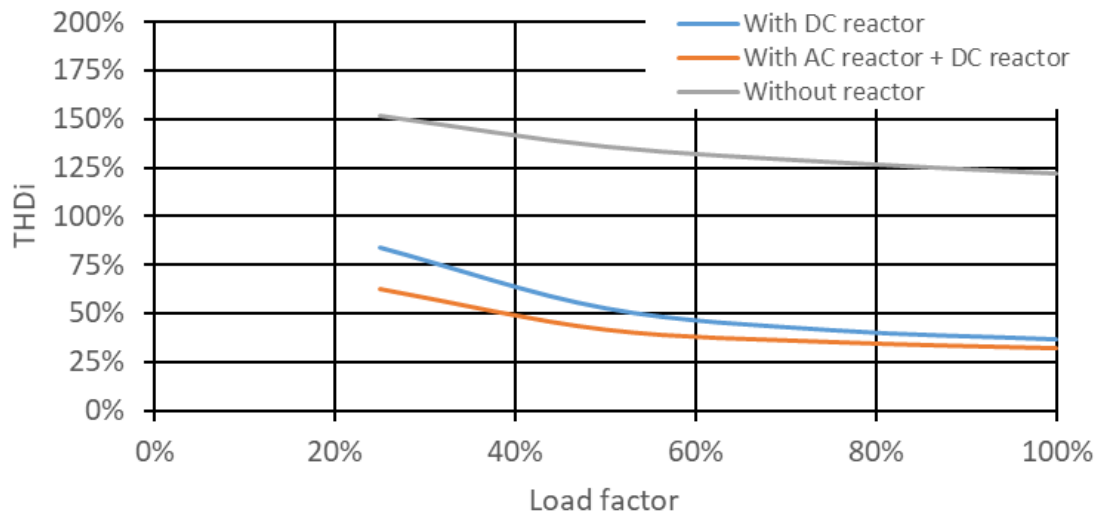


Figure4.2 Load factor - THDi characteristics

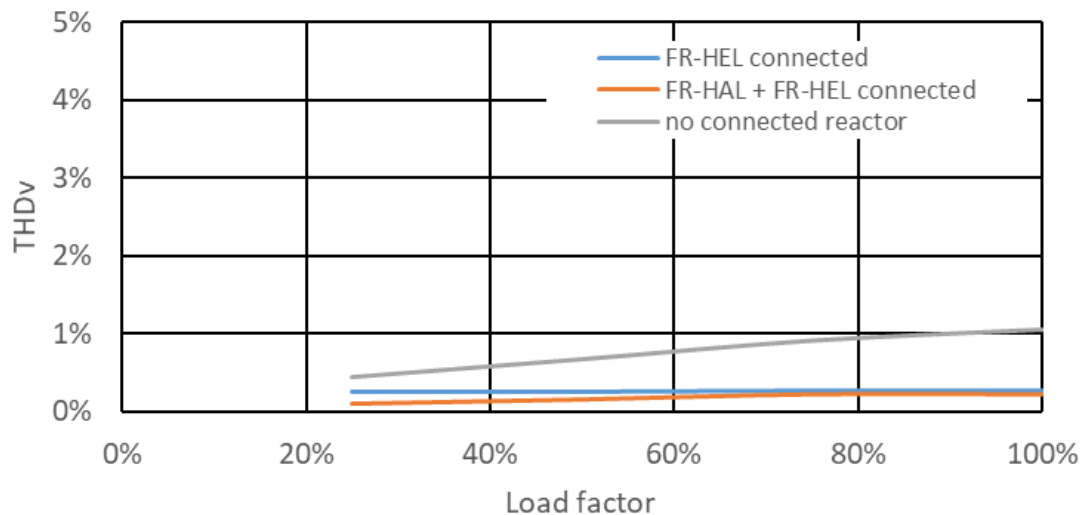


Figure4.3 Load factor - THDv characteristics

MODELS: FR-D840 (0.4K-012 to 15K-295)

5. Simulation result of FR-D840-3.7K-081 [ND rating]

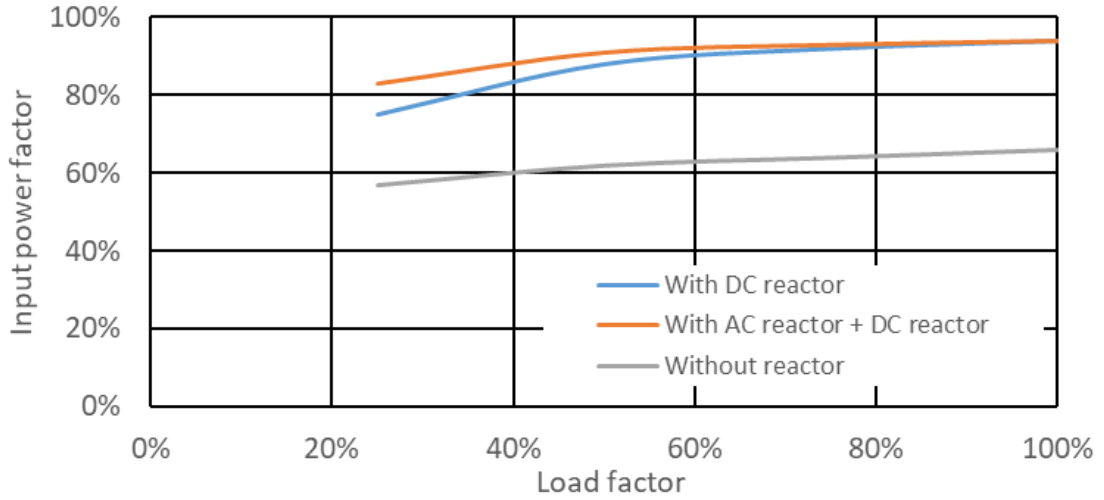


Figure5.1 Load factor - input power factor characteristics

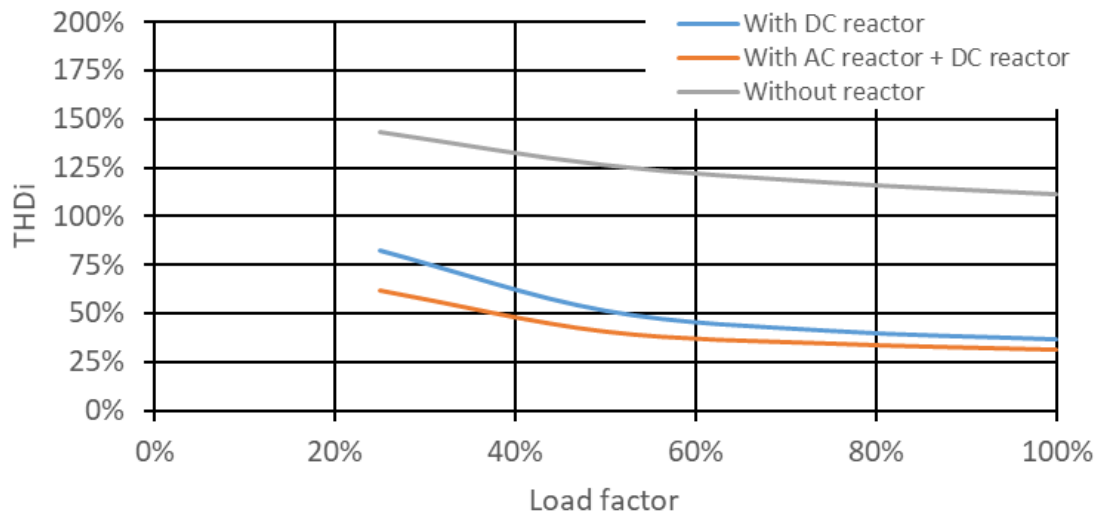


Figure5.2 Load factor - THDi characteristics

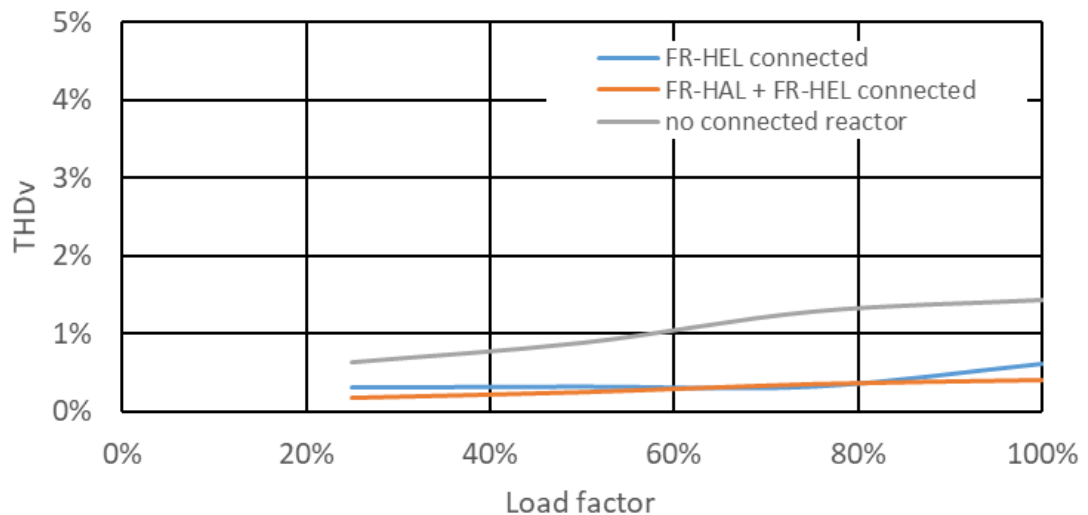


Figure5.3 Load factor - THDv characteristics

MODELS: FR-D840 (0.4K-012 to 15K-295)

6. Simulation result of FR-D840-5.5K-120 [ND rating]

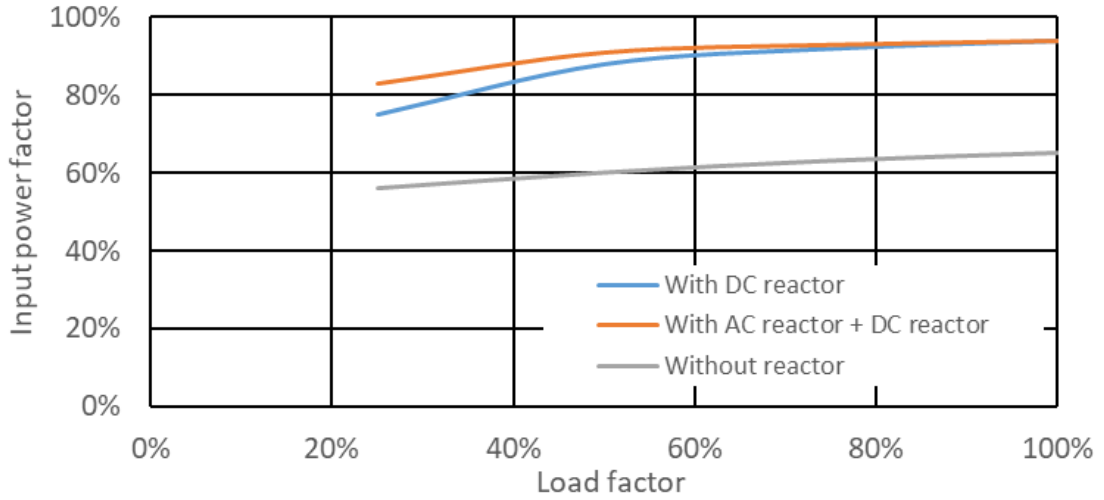


Figure6.1 Load factor - input power factor characteristics

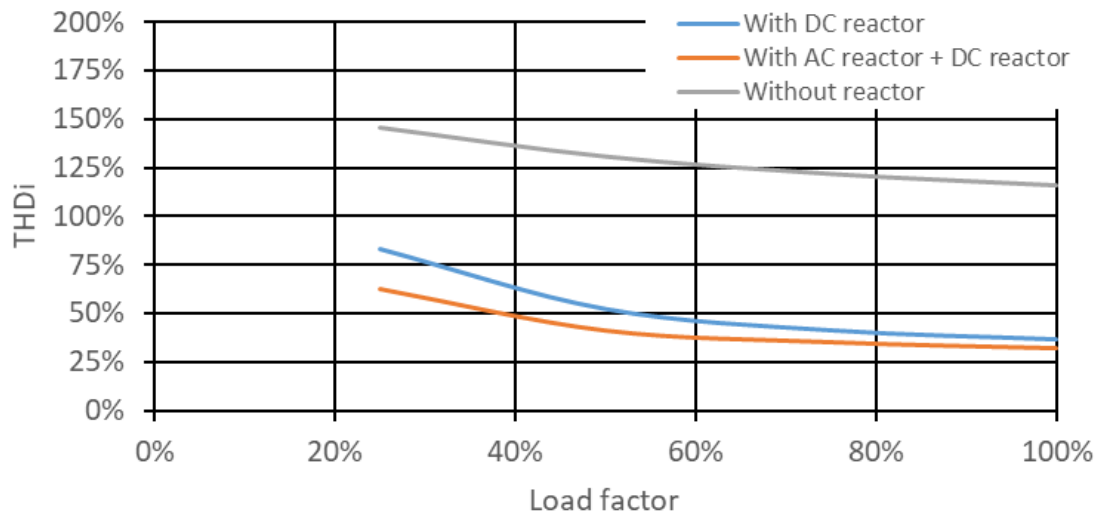


Figure6.2 Load factor - THDi characteristics

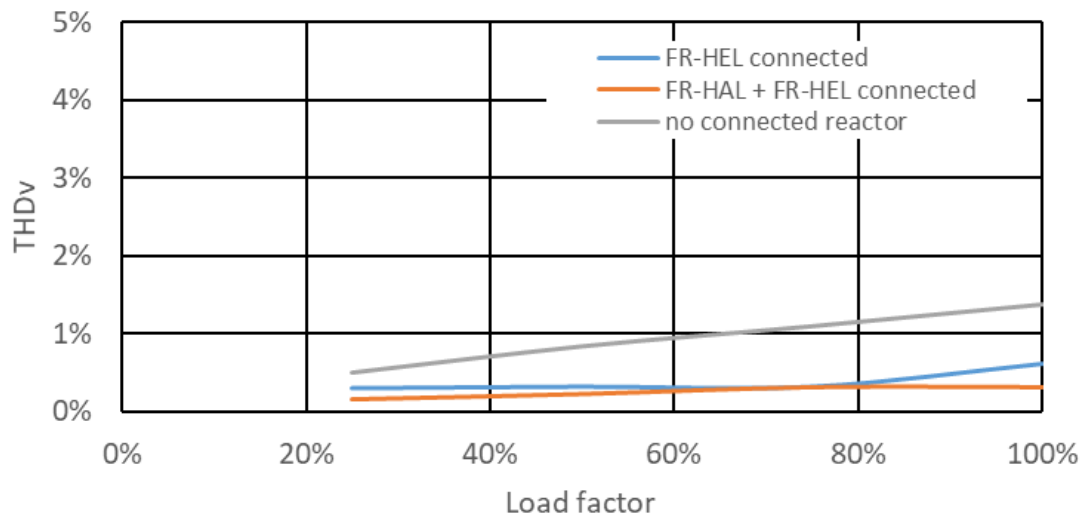


Figure6.3 Load factor - THDv characteristics

MODELS: FR-D840 (0.4K-012 to 15K-295)

7. Simulation result of FR-D840-7.5K-163 [ND rating]

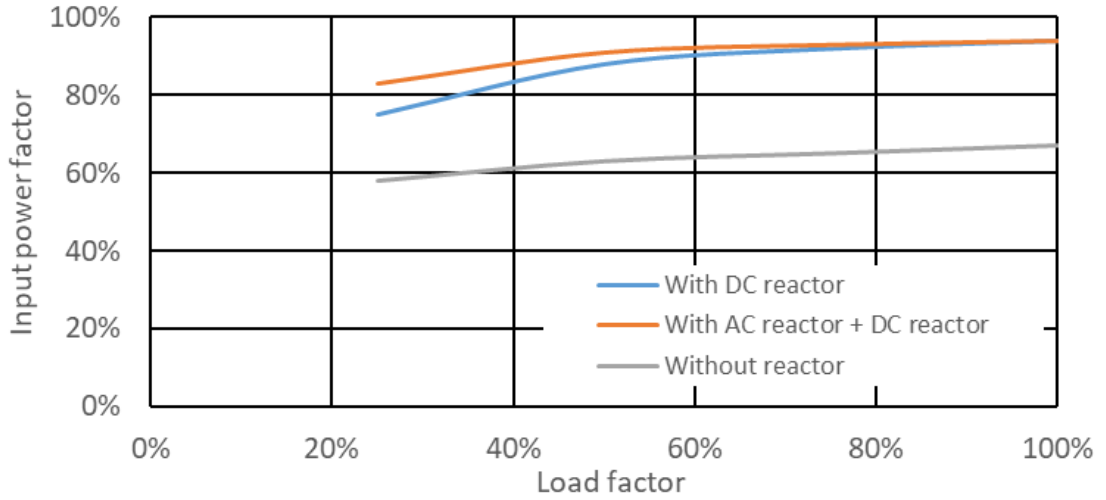


Figure7.1 Load factor - input power factor characteristics

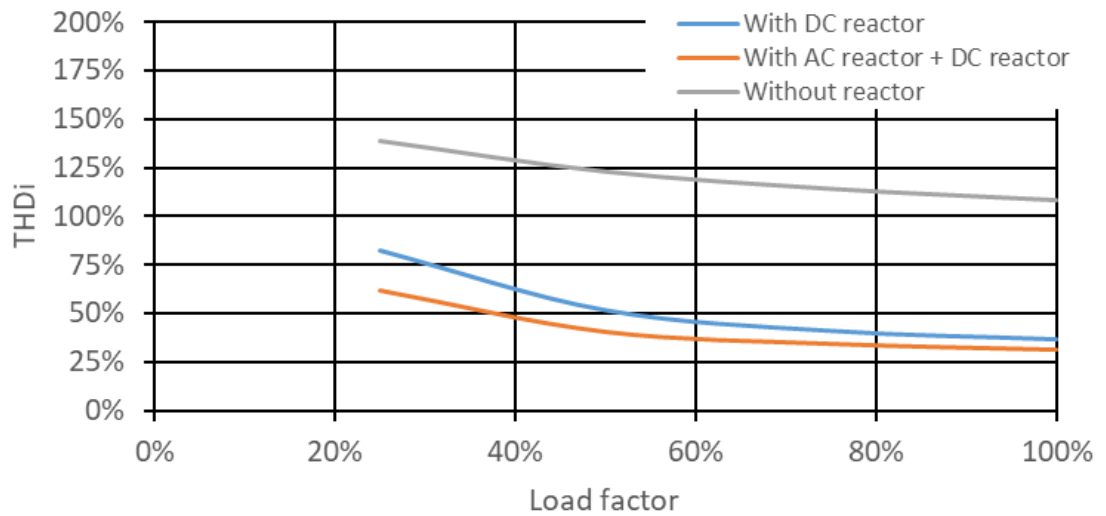


Figure7.2 Load factor - THDi characteristics

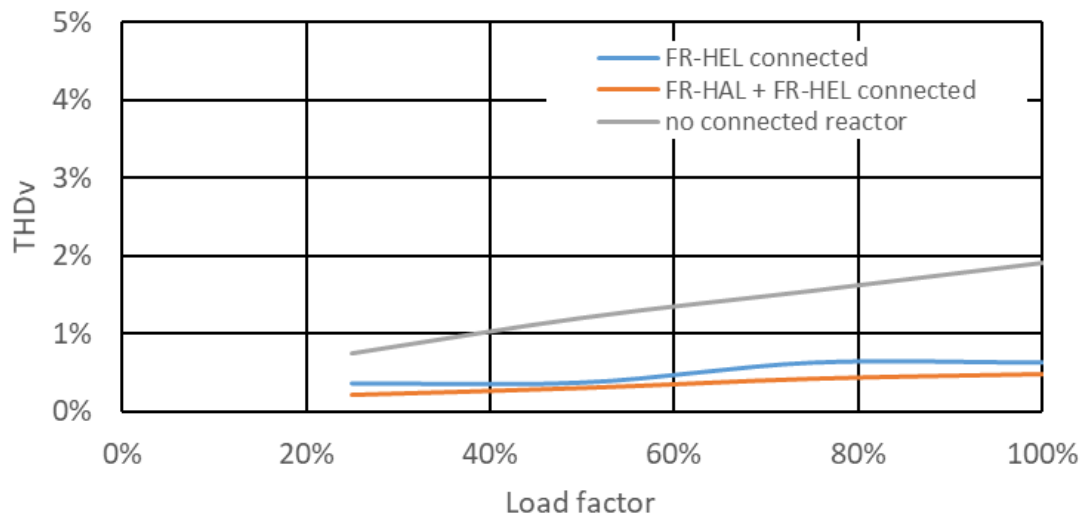


Figure7.3 Load factor - THDv characteristics

MODELS: FR-D840 (0.4K-012 to 15K-295)

8. Simulation result of FR-D840-11K-230 [ND rating]

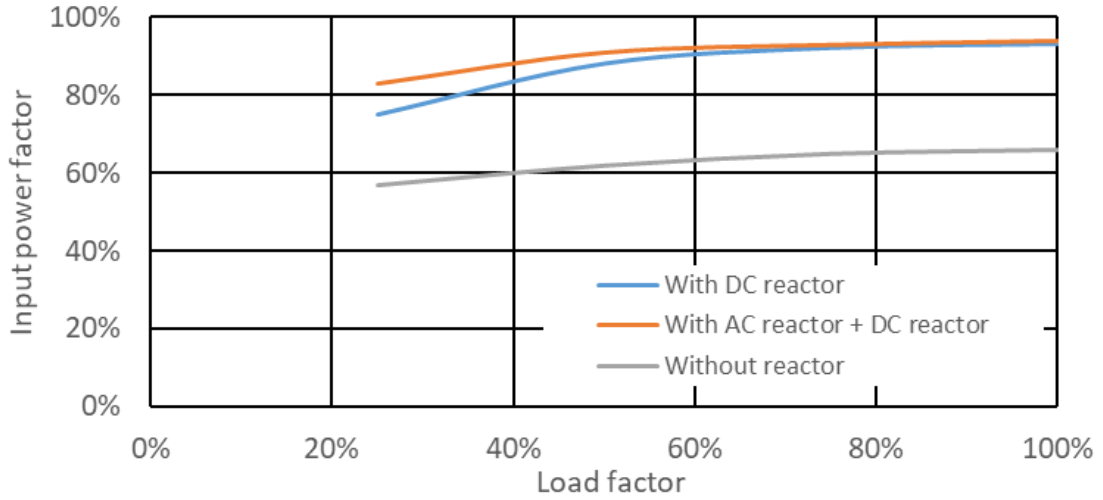


Figure8.1 Load factor - input power factor characteristics

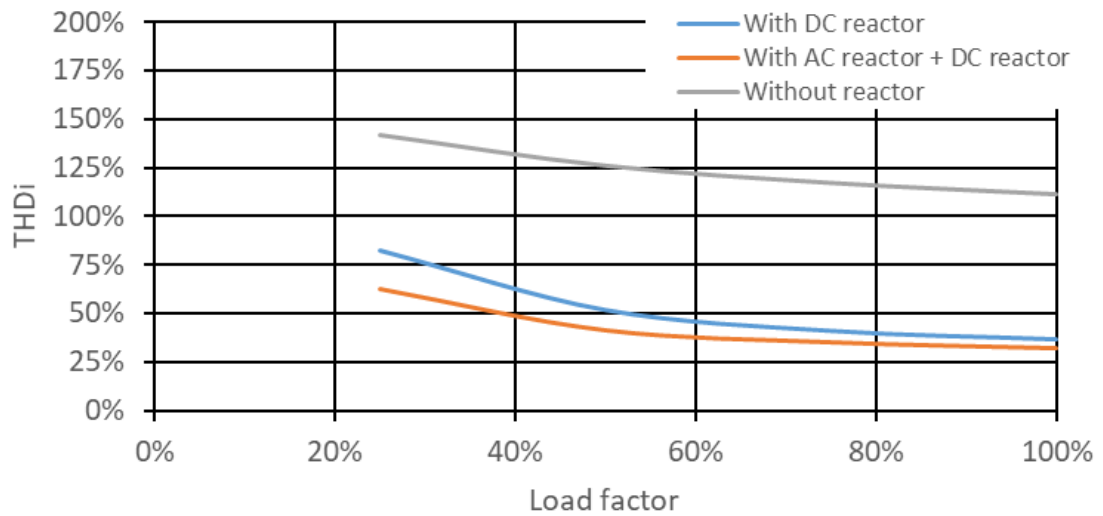


Figure8.2 Load factor - THDi characteristics

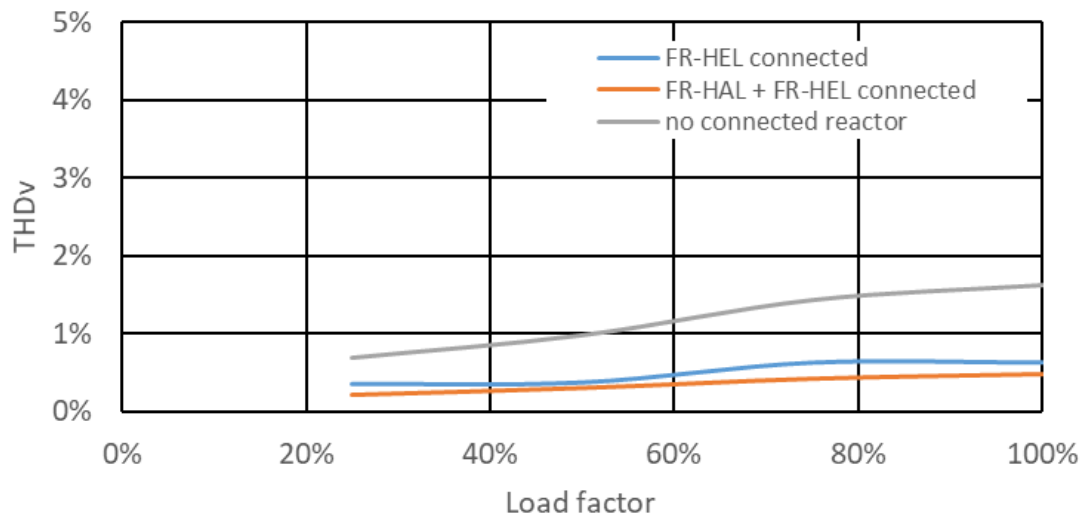


Figure8.3 Load factor - THDv characteristics

MODELS: FR-D840 (0.4K-012 to 15K-295)

9. Simulation result of FR-D840-15K-295 [ND rating]

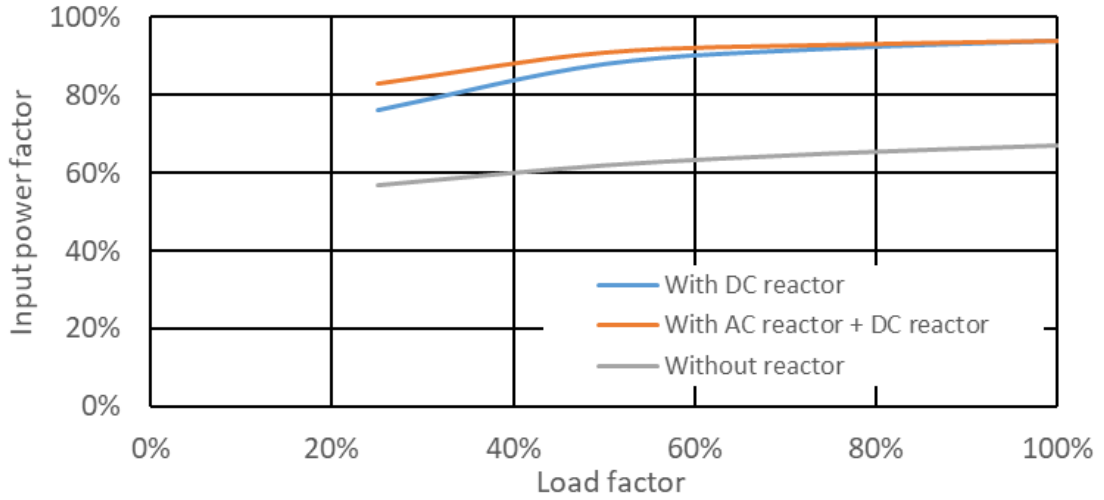


Figure9.1 Load factor - input power factor characteristics

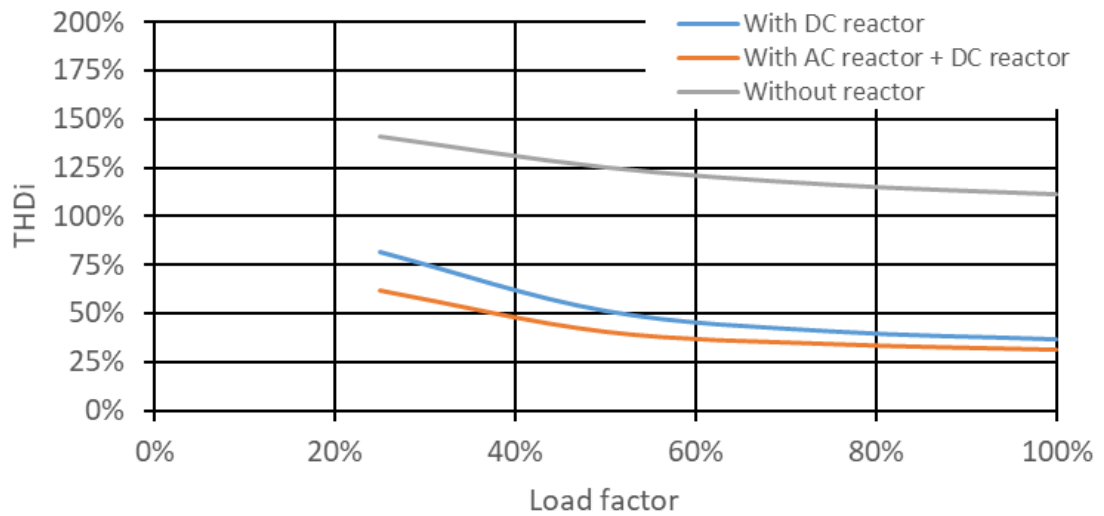


Figure9.2 Load factor - THDi characteristics

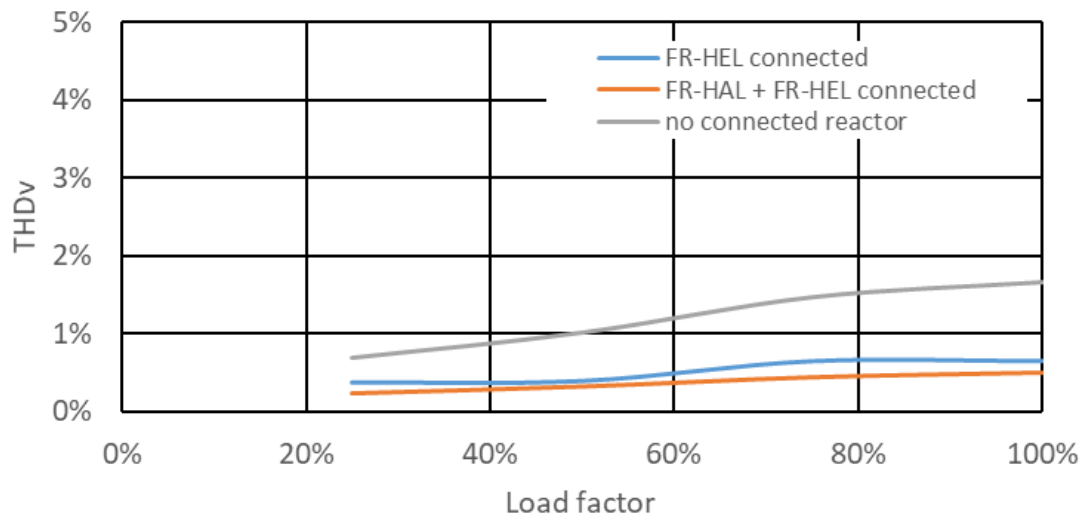


Figure9.3 Load factor - THDv characteristics

MODELS: FR-D840 (0.4K-012 to 15K-295)

10. Simulation result of FR-D840-0.4K-012 [SLD rating]

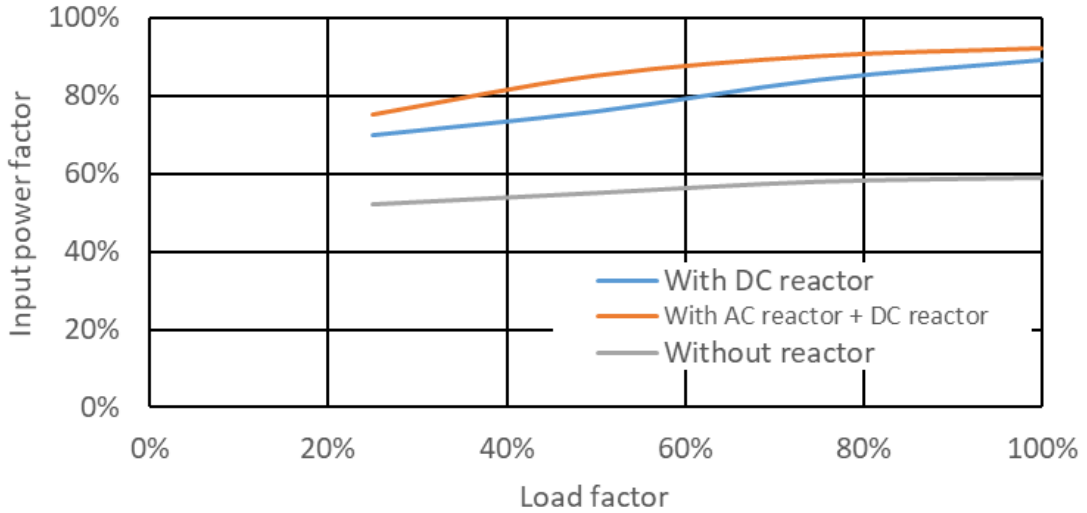


Figure10.1 Load factor - input power factor characteristics

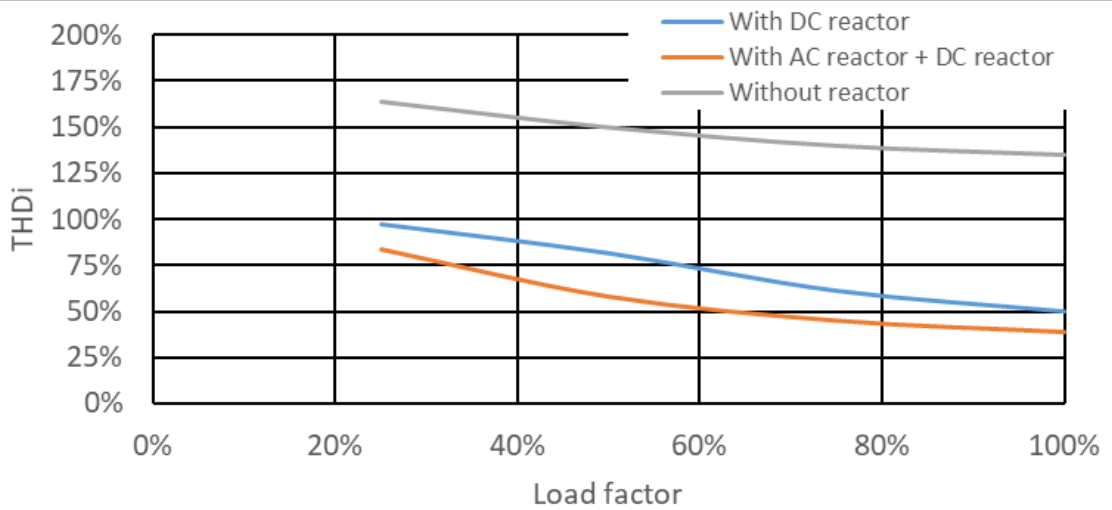


Figure10.2 Load factor - THDi characteristics

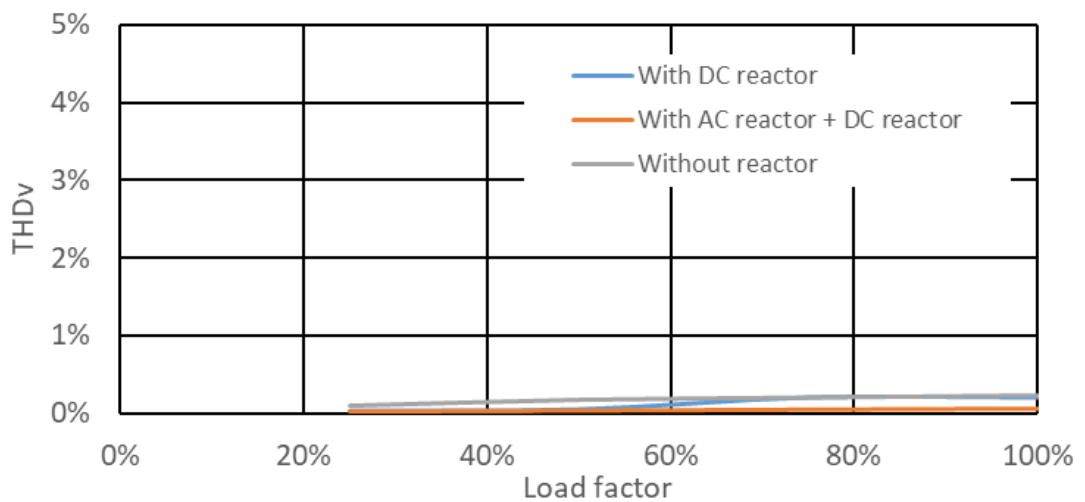


Figure10.3 Load factor - THDv characteristics

MODELS: FR-D840 (0.4K-012 to 15K-295)

11. Simulation result of FR-D840-0.75K-022 [SLD rating]

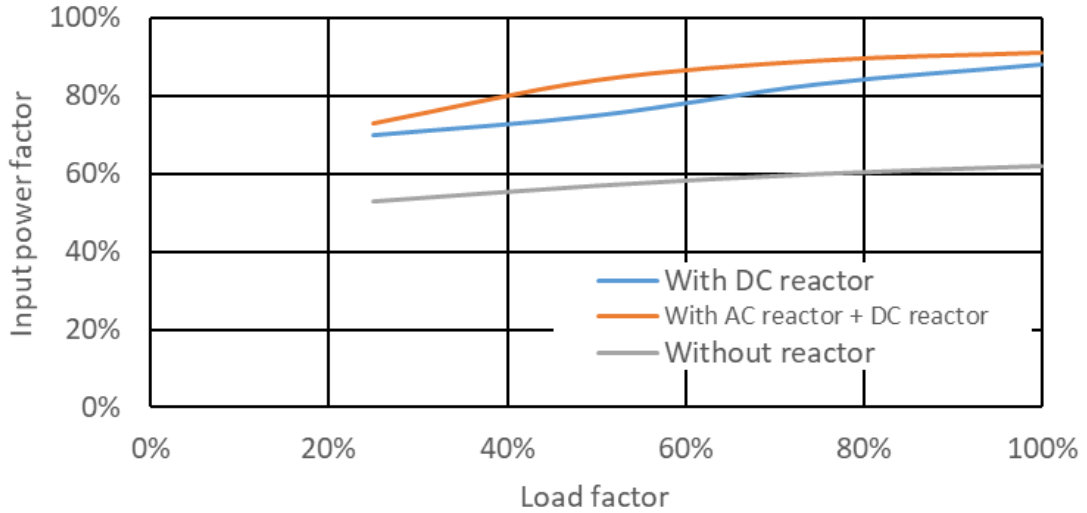


Figure11.1 Load factor - input power factor characteristics

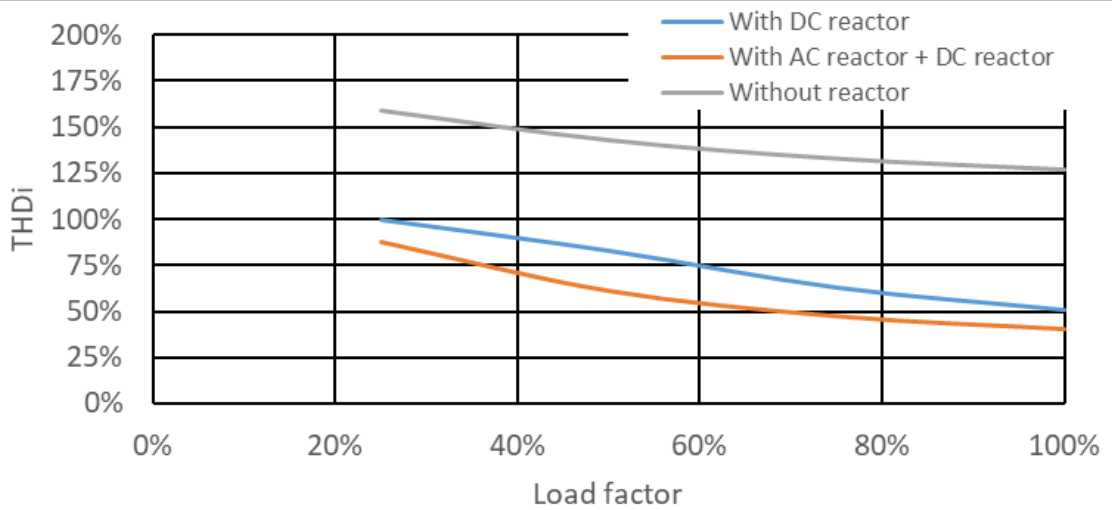


Figure11.2 Load factor - THDi characteristics

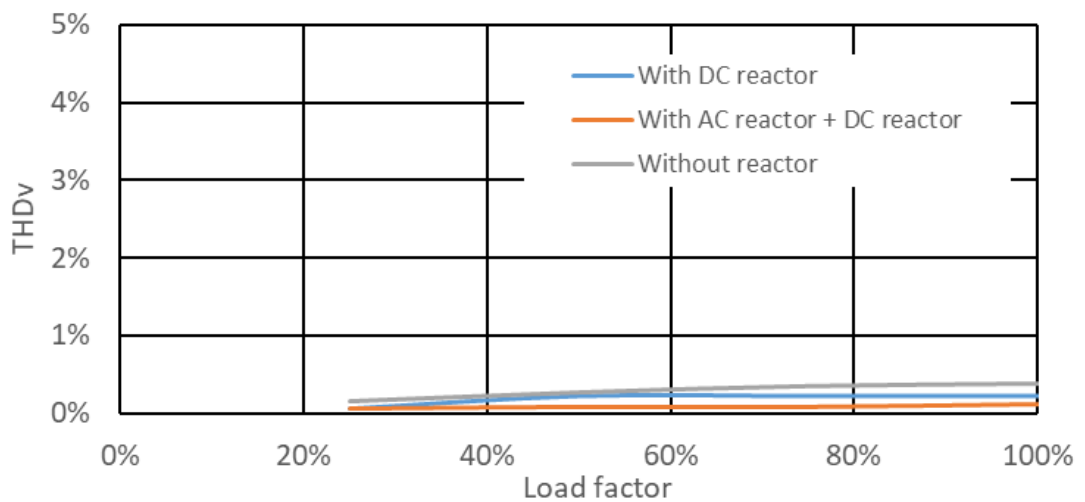


Figure11.3 Load factor - THDv characteristics

MODELS: FR-D840 (0.4K-012 to 15K-295)

12. Simulation result of FR-D840-1.5K-037 [SLD rating]

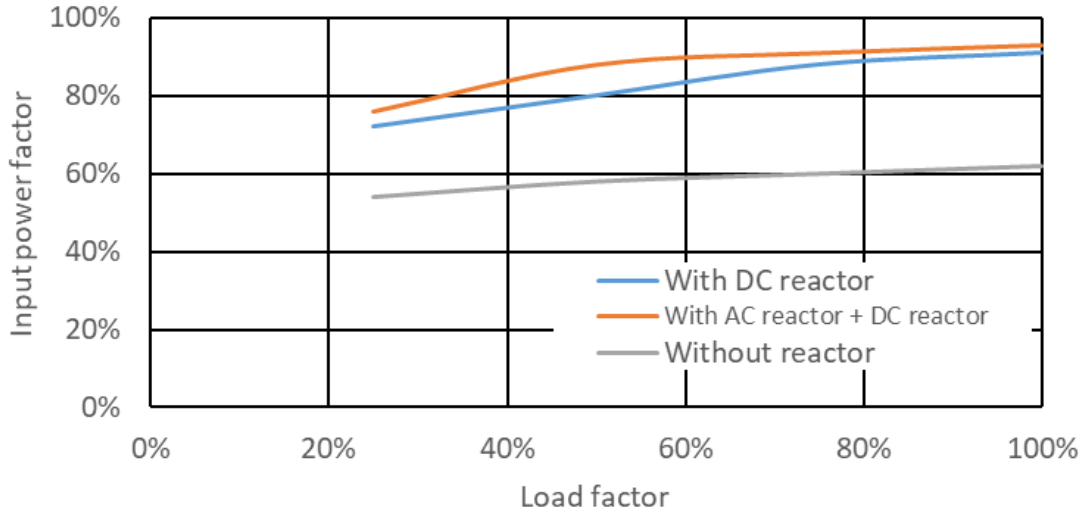


Figure12.1 Load factor - input power factor characteristics

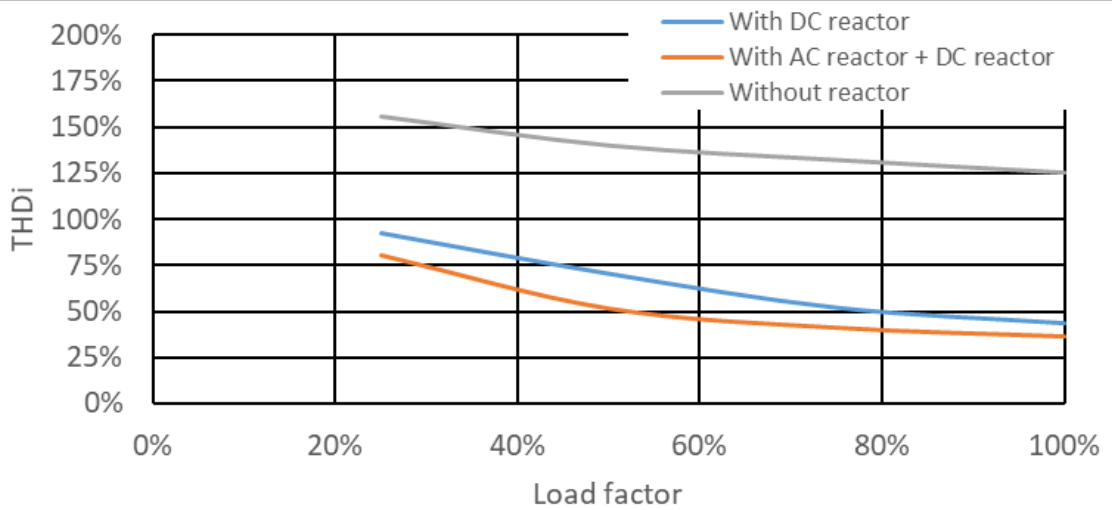


Figure12.2 Load factor - THDi characteristics

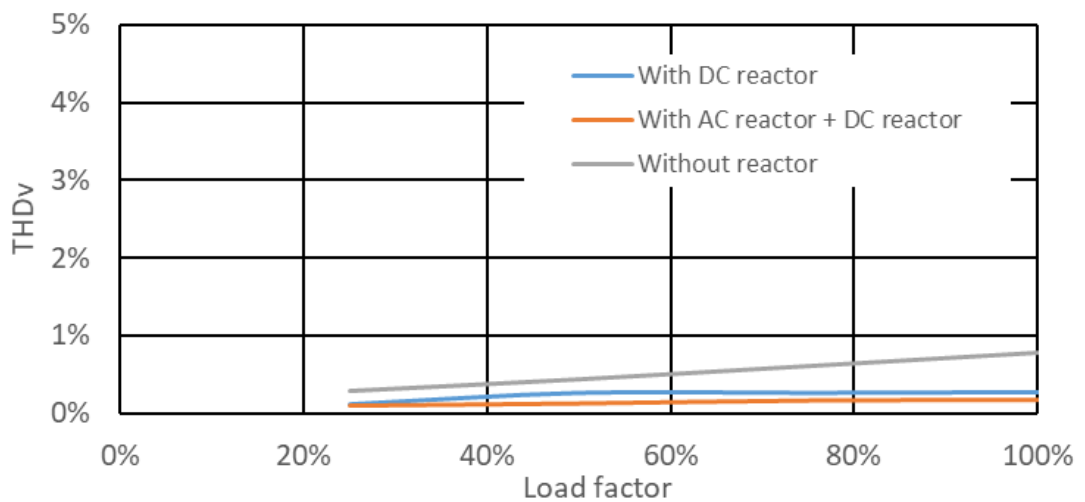


Figure12.3 Load factor - THDv characteristics

MODELS: FR-D840 (0.4K-012 to 15K-295)

13. Simulation result of FR-D840-2.2K-050 [SLD rating]

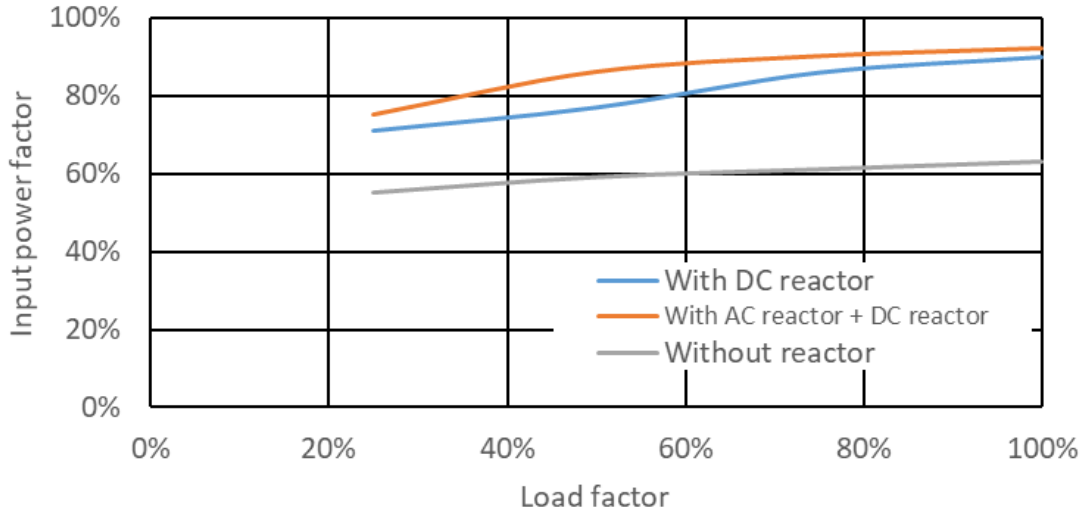


Figure13.1 Load factor - input power factor characteristics

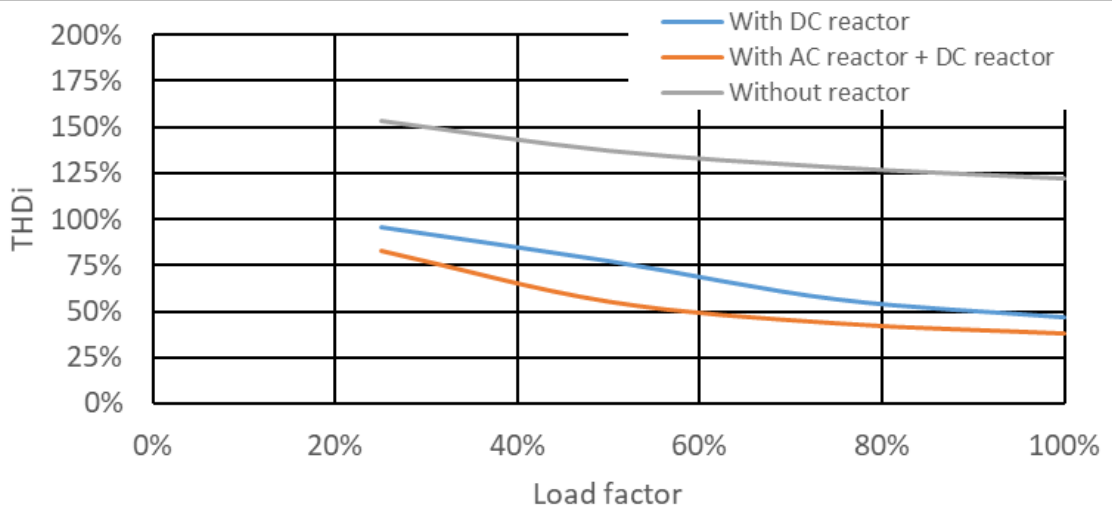


Figure13.2 Load factor - THDi characteristics

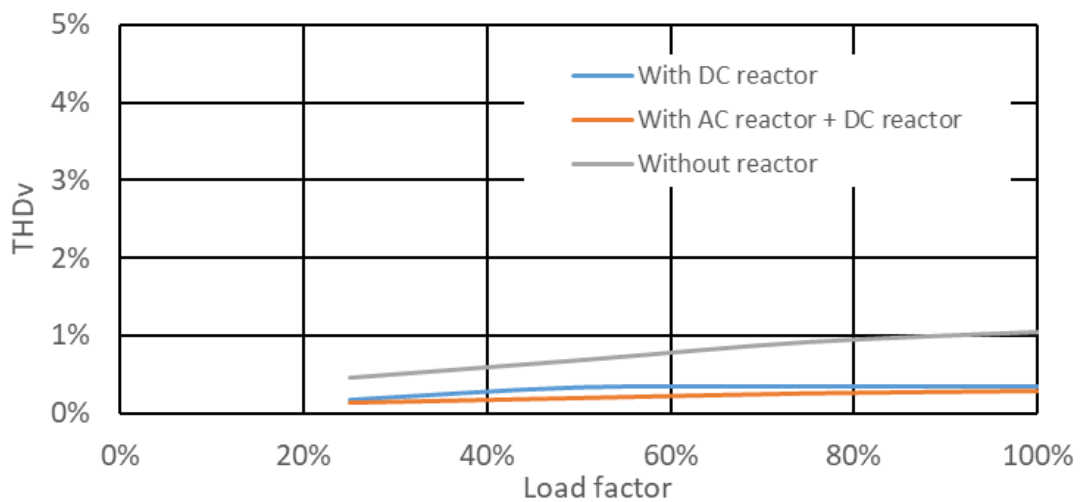


Figure13.3 Load factor - THDv characteristics

MODELS: FR-D840 (0.4K-012 to 15K-295)

14. Simulation result of FR-D840-3.7K-081 [SLD rating]

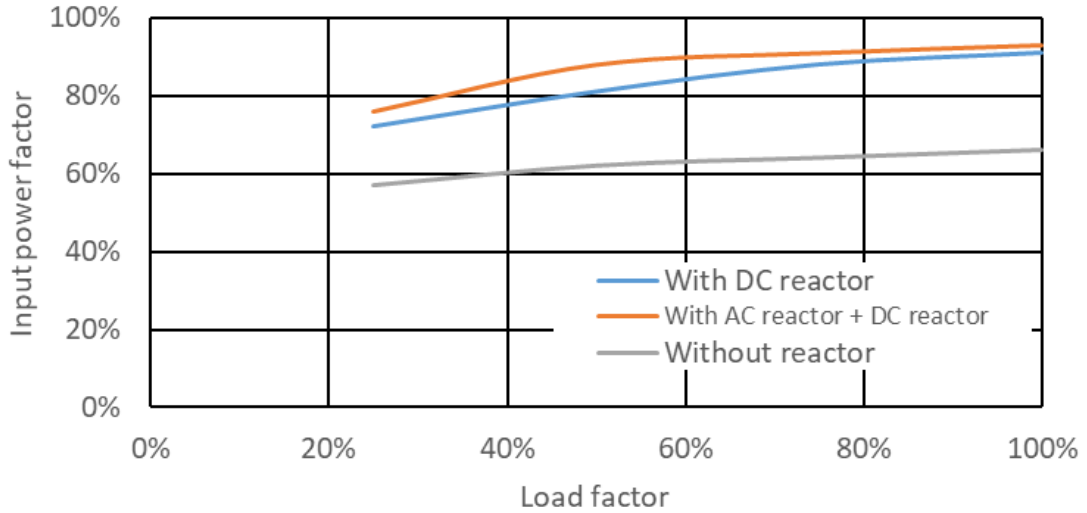


Figure14.1 Load factor - input power factor characteristics

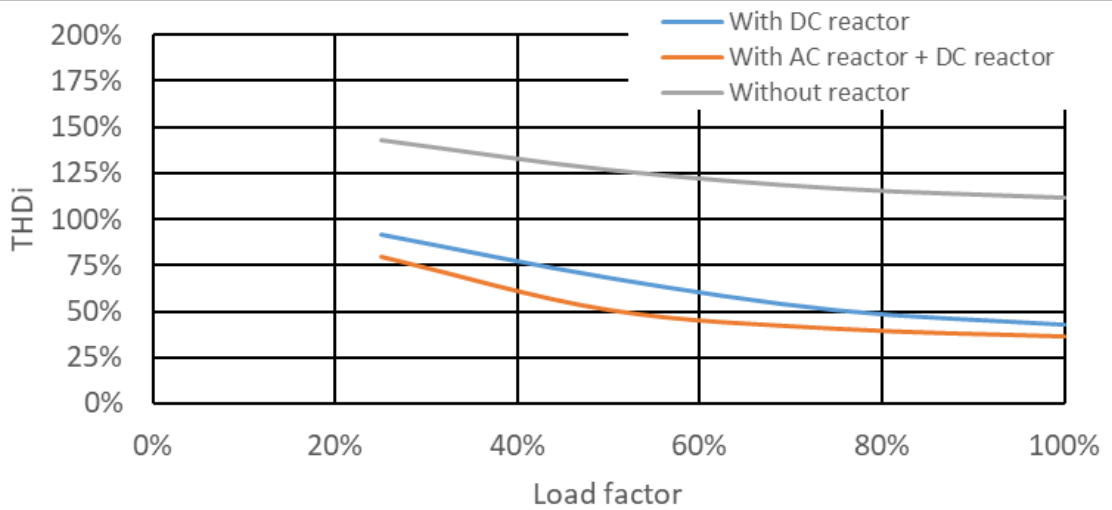


Figure14.2 Load factor - THDi characteristics

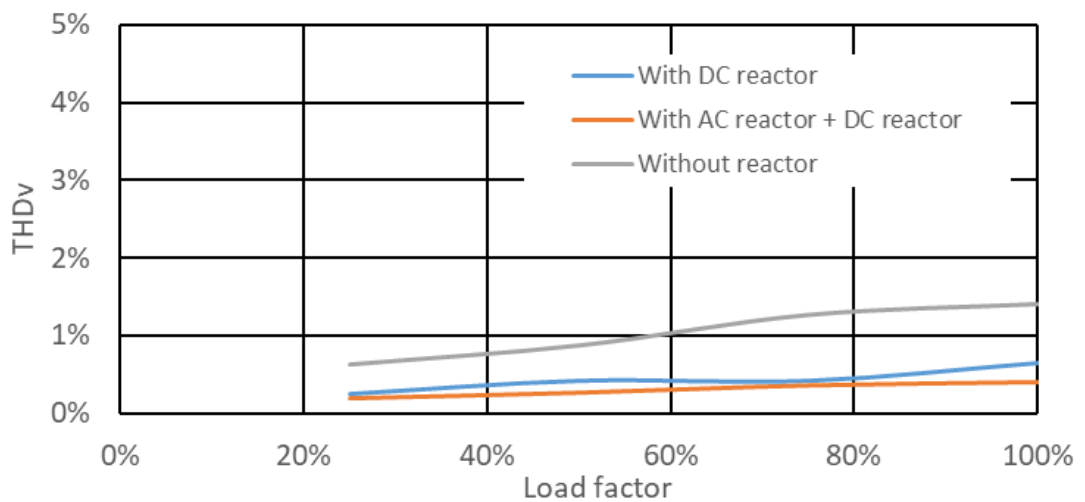


Figure14.3 Load factor - THDv characteristics

MODELS: FR-D840 (0.4K-012 to 15K-295)

15. Simulation result of FR-D840-5.5K-120 [SLD rating]

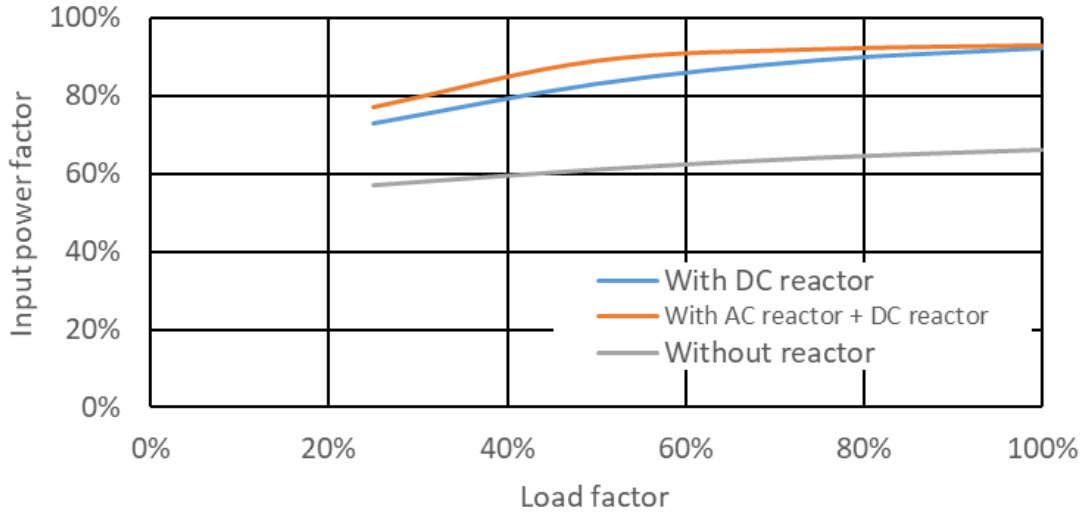


Figure15.1 Load factor - input power factor characteristics

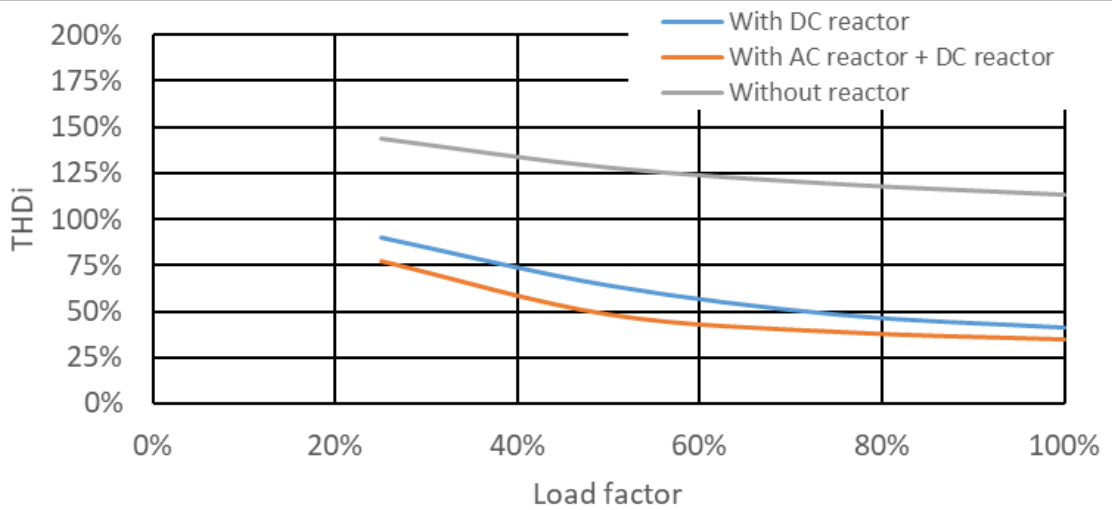


Figure15.2 Load factor - THDi characteristics

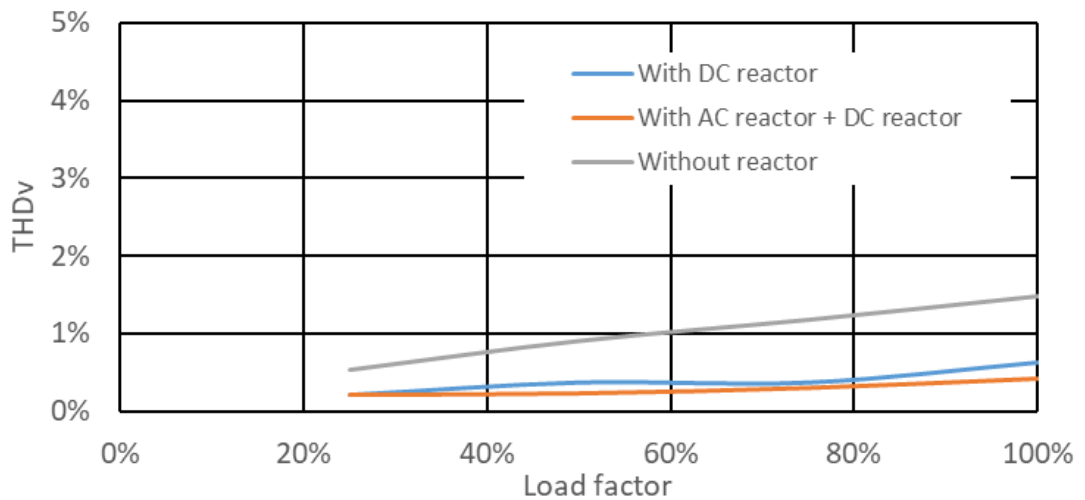


Figure15.3 Load factor - THDv characteristics

MODELS: FR-D840 (0.4K-012 to 15K-295)

16. Simulation result of FR-D840-7.5K-163 [SLD rating]

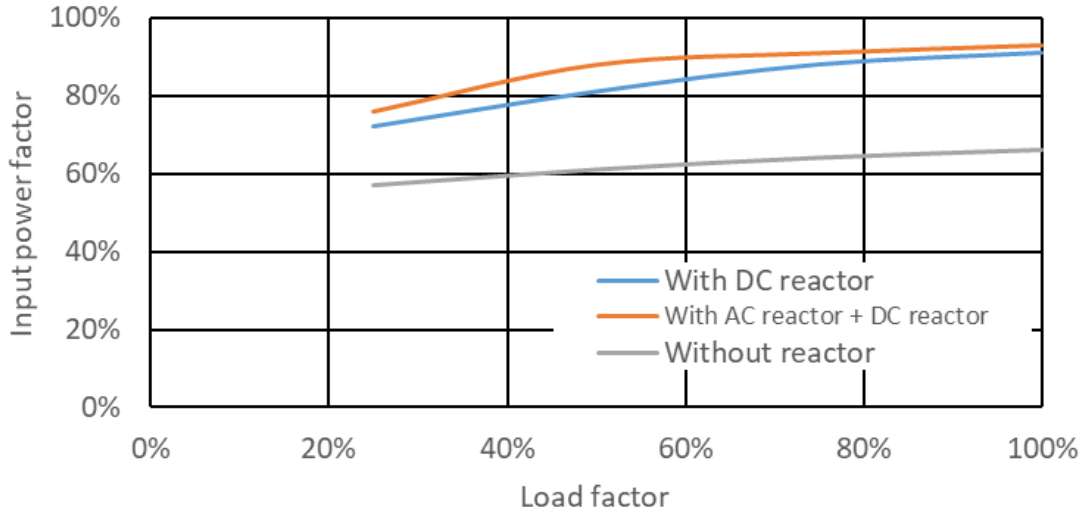


Figure16.1 Load factor - input power factor characteristics

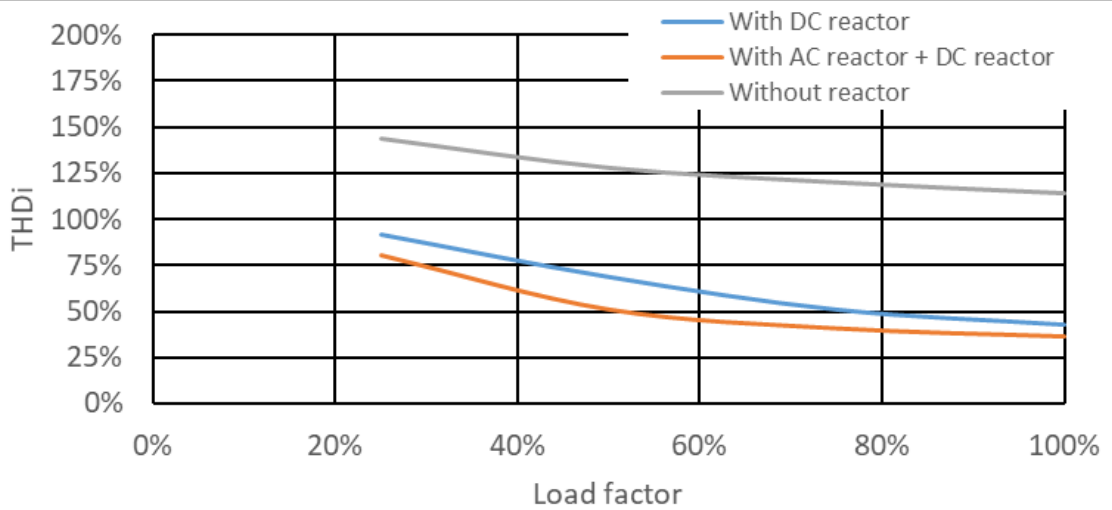


Figure16.2 Load factor - THDi characteristics

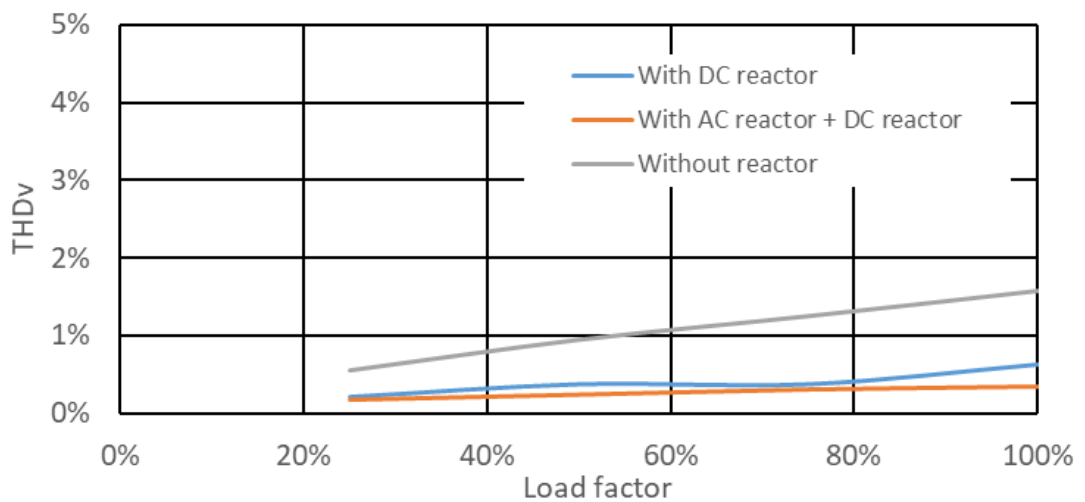


Figure16.3 Load factor - THDv characteristics

MODELS: FR-D840 (0.4K-012 to 15K-295)

17. Simulation result of FR-D840-11K-230 [SLD rating]

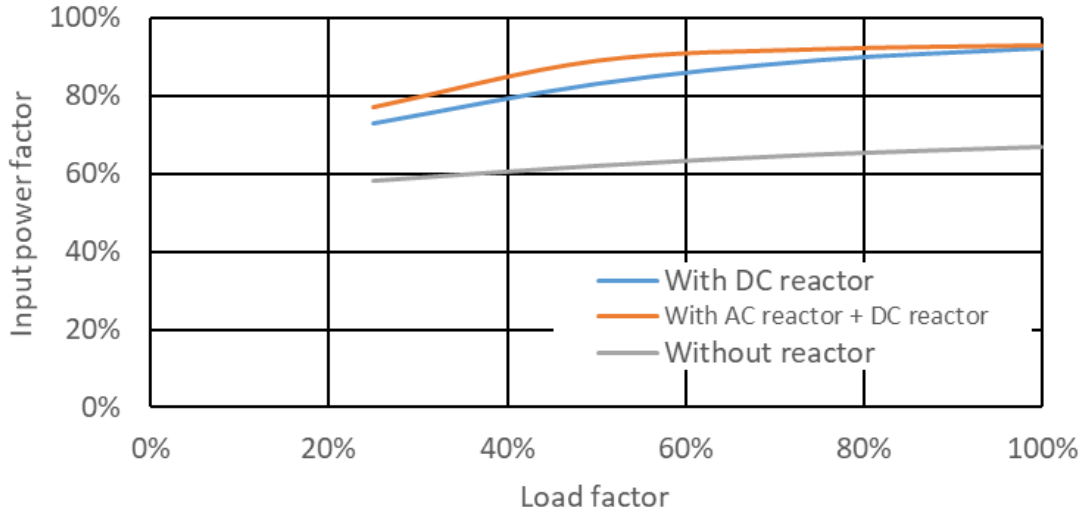


Figure17.1 Load factor - input power factor characteristics

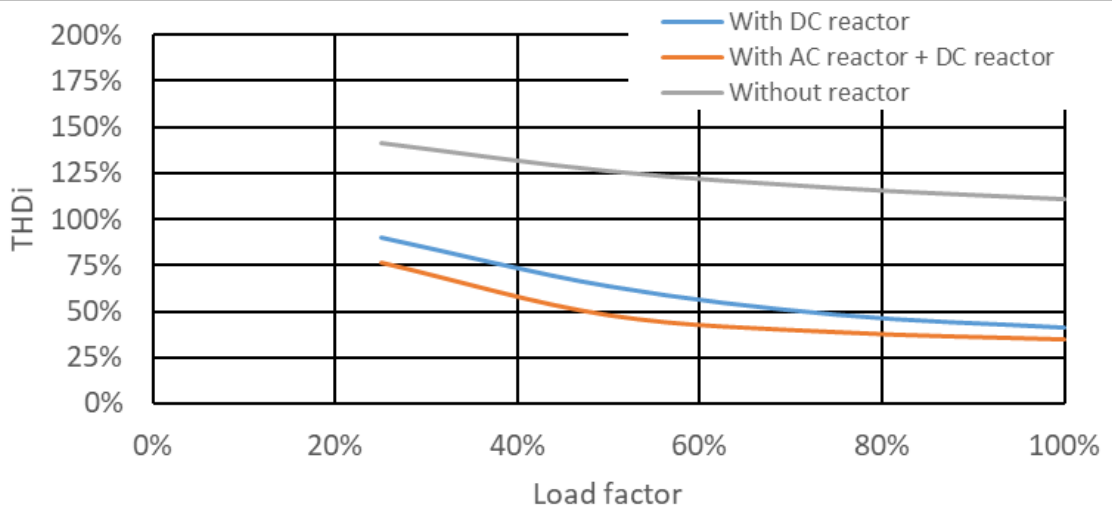


Figure17.2 Load factor - THDi characteristics

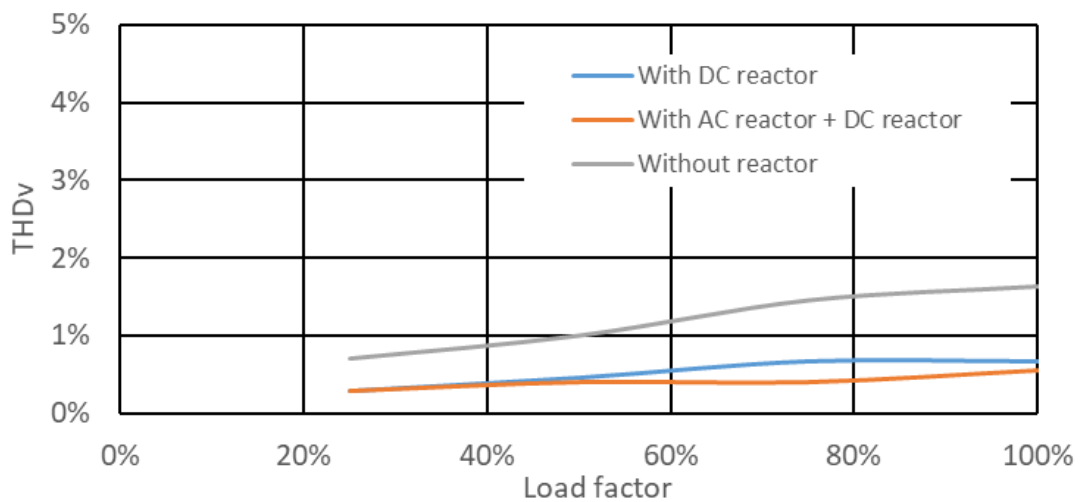


Figure17.3 Load factor - THDv characteristics

MODELS: FR-D840 (0.4K-012 to 15K-295)

18. Simulation result of FR-D840-15K-295 [SLD rating]

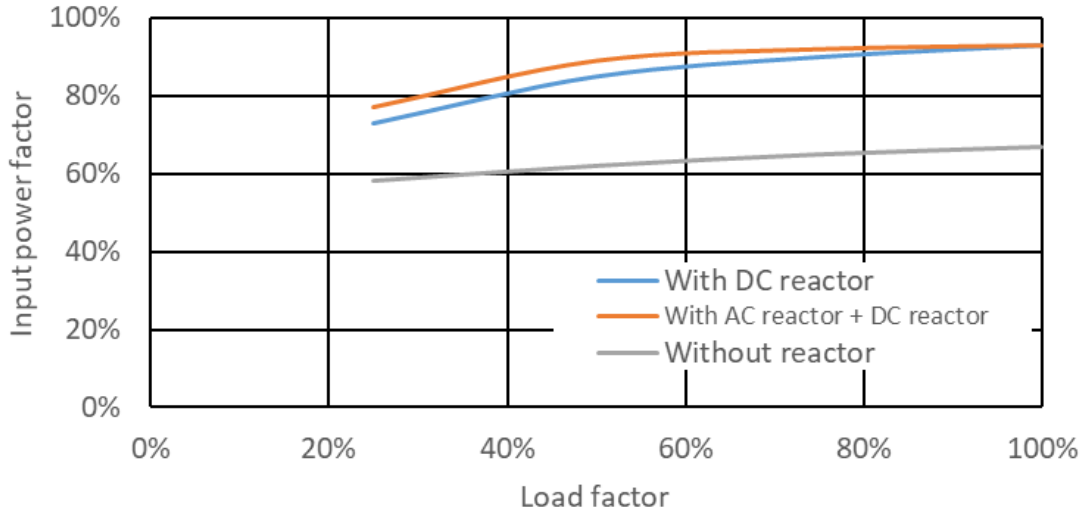


Figure18.1 Load factor - input power factor characteristics

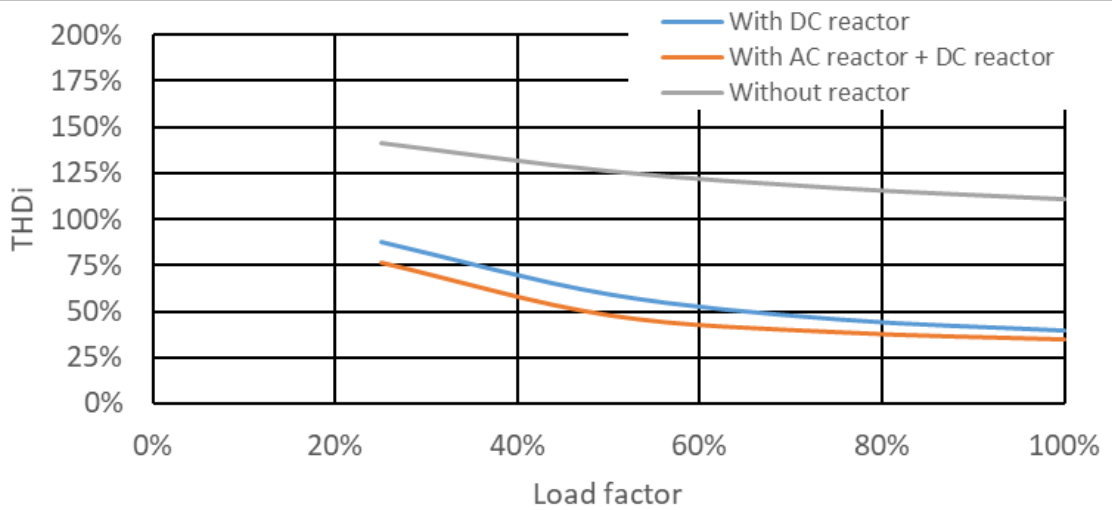


Figure18.2 Load factor - THDi characteristics

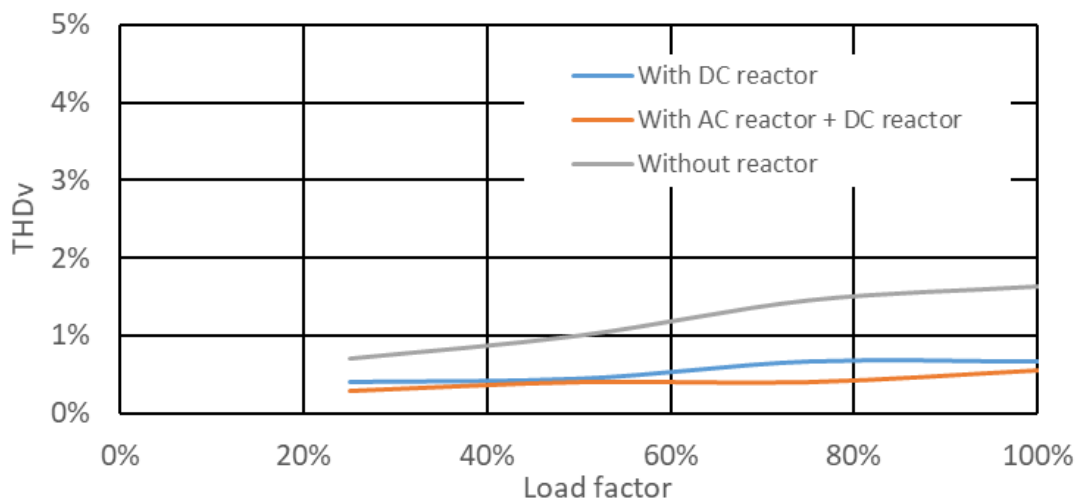


Figure18.3 Load factor - THDv characteristics