

Commercial hybrid closed-loop systems characteristics



ALGORITHM	Medtronic 670G and 770G	Medtronic 780G	Tandem Control IQ		Ypsopump CamAPS FX		Insulet Omnipod 5
TARGET FOR AUTOMATIC BASAL RATE ADJUSTMENT	6.7 mmol/L (preset)	5.5 mmol/L (default) Possibility to chose 6.1 or 6.7 mmol/L	6.25 – 8.9 mmol/L (preset)		5.8 mmol/L (preset). Programmable from 4.4 mmol/L to 11.0 mmol/L (30-min increments)		6.1, 6.7, 7.2, 7.8 or 8.3 mmol/L (possibility of 8 segments over 24 hours)
TARGET FOR SPECIFIC ACTIVITIES	TEMPORARY TARGET 8.3 mmol/L (preset) • Start and end time must be set.	TEMPORARY TARGET 8.3 mmol/L (preset) • Start and end time must be set. • No correction bolus when activated.	SLEEP 6.25 – 6.7 mmol/L (preset) • No automatic correction boluses. • Start and end times must be set. • Minimum duration of 5 hours for optimal performance.	EXERCISE 7.8 - 8.9 mmol/L • To activate 60-90 minutes before exercise and to stop manually • Stops insulin administration if glucose reaches 4.4 mmol/L.	BOOST • Time of start can be set (0 to 12:59)	EASE-OFF • Time of start and duration can be set (0 to 23:59)	ACTIVITY 8.3 mmol/L (present) • Duration to be set from 1 to 24h (1h-increments) • Reduces automated insulin delivery
TARGET FOR BOLUS CALCULATION	8.3 mmol/L (preset)	6.7 mmol/L (preset)	6.1 mmol/L (preset)		Set between 4.0 and 11.0 mmol/L		Set between 6.1 to 8.3 mmol/L
INSULIN TAKEN INTO CONSIDERATION IN THE ACTIVE INSULIN (ON BOARD) CALCULATION	BOLUSES TO COVER CARBS + CORRECTION BOLUSES	BOLUSES TO COVER CARBS + CORRECTION BOLUSES (manual and automatic)	BOLUSES TO COVER CARBS + CORRECTION BOLUSES + BASAL RATE ADJUSTMENTS (increased or decreased) Remember to suspend the administration of insulin when disconnecting from the pump (e.g., when swimming, taking a shower) so that the amount of active insulin displayed is accurate.		BOLUSES TO COVER CARBS + CORRECTION BOLUSES		BOLUSES TO COVER CARBS + CORRECTION BOLUSES + BASAL RATE ADJUSTMENTS
INSULIN DURATION OF ACTION	3 TO 4 HOURS (To be programmed in 15-min increments)	2 TO 3 HOURS (2H recommended)	5 HOURS (preset)		2 TO 8 HOURS		2 TO 6 HOURS (to be programmed, 0.5h-increments)
AUTOMATED BASAL RATE Determined by the algorithm based on:	• Current blood sugar value and trend • Blood sugar target • Active insulin • Insulin needs of the past 6 days Doesn't take into consideration the pump settings.	• Current blood sugar value and trend • Blood sugar target • Active insulin • Insulin needs of the past 6 days Doesn't take into consideration the pump settings.	• Current blood sugar value and trend • Blood sugar target • Active insulin • Programmed basal rate* *Option to set customized profiles (e.g., different basal rates for sick days or weekends)		• Current blood sugar value and trend • Blood sugar target • Active insulin		• Current blood sugar value and trend • Blood sugar target • Active insulin

Commercial hybrid closed-loop systems characteristics

	Medtronic 670G and 770G	Medtronic 780G	Tandem Control IQ	Ypsopump CamAPS FX	Insulet Omnipod 5
INSULIN-TO-CARB RATIO	MANUAL Ratios must be programmed and can be adjusted. Identical to manual mode. No option to adjust the recommended mealtime bolus dose.		MANUAL Ratios must be programmed and can be adjusted. Identical to manual mode.	MANUAL Ability to set meal sizes	MANUAL Ratios must be programmed and can be adjusted. Ability to program frequently consumed foods, type and size of meals.
EXTENDED BOLUS OPTION	NO		YES , up to 2 hours	YES Insulin infusion will be given over 3 to 4 hours if the slowly absorbed meal option is selected.	Only in manual mode.
CORRECTION BOLUS	MANUAL If blood sugar remains high despite basal rate adjustment.	AUTOMATED every 5 minutes if needed	AUTOMATED Hourly when blood sugar is higher 10.0 mmol/L. The system administers 60% of the corection bolus calculated based on the correction factor. Option to administer a manual bolus at all times.	MANUAL IF NEEDED	MANUAL IF NEEDED
CORRECTION FACTOR (or sensitivity factor)	AUTOMATED Calculated and adjusted by the pump		MANUAL Must be programmed and can be adjusted* Remember: the duration of action is set to 5 hours. *The calculation is $90 \div \text{total daily dose (adults)}$.	MANUAL Must be programmed and can be adjusted	MANUAL Must be programmed and can be adjusted
CLOSED LOOP SUSPENSION	- Signal loss (CGM) - No calibrations - Extended hyperglycemic episode - No action taken following alarms	CGM signal loss for more than 4 hours.	Signal loss (CGM)	Signal loss of CGM or smartphone	CGM signal loss for more than 20 minutes enables automated mode limited
SETTINGS TO BE ADJUSTED	INSULIN-TO-CARB RATIO + INSULIN DURATION OF ACTION* *Make sure to occasionally check and adjust your basal rate settings so that they are as close as possible to your optimal settings if you have to switch to manual mode or manual injections (e.g., automatic mode turning off, pump failure)		BASAL RATES + INSULIN-TO-CARB RATIO + CORRECTION FACTOR	INSULIN-TO-CARB RATIO + CORRECTION FACTOR + MEAL SIZE + INSULIN DURATION OF ACTION + TARGET FOR BOLUS CALCULATOR	INSULIN-TO-CARB RATIO + CORRECTION FACTOR + INSULIN DURATION OF ACTION + REVERSE CORRECTION (ON/OFF)

*not yet available in Canada